



[cancer.org](https://www.cancer.org) | 1.800.227.2345

---

# About Colorectal Cancer

## Overview and Types

If you've been diagnosed with colorectal cancer or are worried about it, you likely have a lot of questions. Learning some basics is a good place to start.

- [What Is Colorectal Cancer?](#)

## Research and Statistics

See the latest estimates for new cases of colorectal cancer and deaths in the US and what research is currently being done.

- [Key Statistics for Colorectal Cancer](#)
- [What's New in Colorectal Cancer Research?](#)

---

# What Is Colorectal Cancer?

Colorectal cancer is a cancer that starts in the colon or the rectum. These cancers can also be named colon cancer or rectal cancer, depending on where they start. Colon cancer and rectal cancer are often grouped together because they have many features in common.

Cancer starts when cells in the body start to grow out of control. Cells in nearly any part of the body can become cancer, and can spread to other areas of the body. To learn

more about how cancers start and spread, see [What Is Cancer?](#)<sup>1</sup>

## How does colorectal cancer start?

### Polyps in the colon or rectum

Most colorectal cancers start as a growth on the inner lining of the colon or rectum. These growths are called *polyps*.

Some types of polyps can change into cancer over time (usually many years), but not all polyps become cancer. The chance of a polyp changing into cancer depends on the type of polyp it is. The 2 main types of polyps are:

- **Adenomatous polyps (adenomas):** These polyps sometimes change into cancer. Because of this, adenomas are called a *pre-cancerous condition*.
- **Hyperplastic polyps and inflammatory polyps:** These polyps are more common, but in general they are not pre-cancerous.

Other factors that can make a polyp more likely to contain cancer or increase someone's risk of developing colorectal cancer include:

- If a polyp larger than 1 cm is found
- If more than 2 polyps are found
- If *dysplasia* is seen in the polyp after it's removed. Dysplasia is another pre-cancerous condition. It means there's an area in a polyp or in the lining of the colon or rectum where the cells look abnormal, but they don't look like true cancer cells.

For more details on the types of polyps and conditions that can lead to colorectal cancer, see [Understanding Your Pathology Report: Colon Polyps](#)<sup>2</sup>.

### How colorectal cancer spreads

If cancer forms in a polyp, it can grow into the wall of the colon or rectum over time. The wall of the colon and rectum is made up of many layers. Colorectal cancer starts in the innermost layer (the mucosa) and can grow outward through some or all of the other layers.

When cancer cells are in the wall, they can then grow into blood vessels or lymph vessels (tiny channels that carry away waste and fluid). From there, they can travel to

nearby lymph nodes or to distant parts of the body.

The stage (extent of spread) of a colorectal cancer depends on how deeply it grows into the wall and if it has spread outside the colon or rectum. For more on staging, see [Colorectal Cancer Stages](#)<sup>3</sup>.

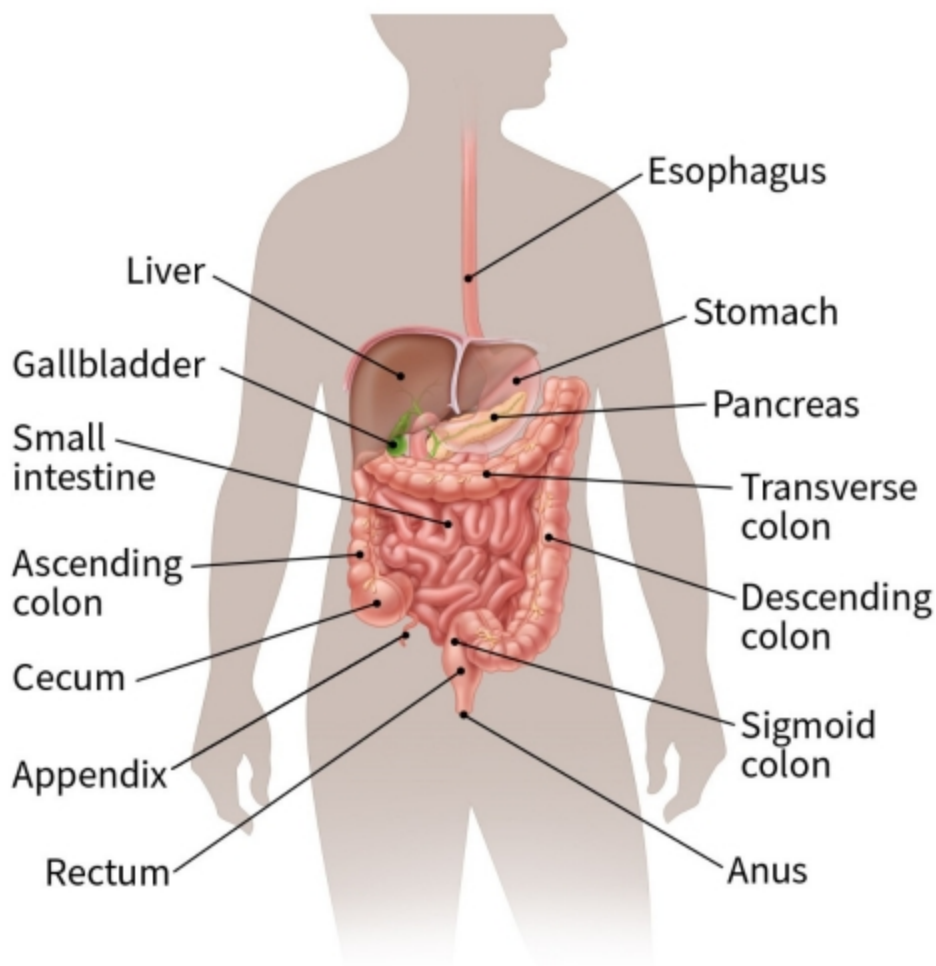
## Where does colorectal cancer grow?

To understand colorectal cancer, it helps to understand the parts that make up the colon and rectum. The colon and rectum make up the large intestine (or large bowel), which is part of the digestive system, also called the *gastrointestinal (GI) system* (see illustration below).

Most of the large intestine is made up of the colon, a muscular tube about 5 feet long. The parts of the colon are named by which way the food is traveling through them.

- The first section is called the **ascending colon**. It starts with a pouch called the cecum, where undigested food comes in from the small intestine. It extends upward on the right side of the abdomen (belly).
- The second section is called the **transverse colon**. It goes across the body from the right to the left side.
- The third section is called the **descending colon** because it descends (travels down) on the left side.
- The fourth section is called the **sigmoid colon** because of its “S” shape. The sigmoid colon joins the rectum, which connects to the anus.

The ascending and transverse sections together are called the **proximal colon**. The descending and sigmoid colon are called the **distal colon**.



### What do the colon and rectum do?

The colon absorbs water and salt from the remaining food matter after it goes through the small intestine (small bowel). The waste matter that's left after going through the colon goes into the **rectum**, the final 6 inches of the digestive system. It's stored there until it passes out of the body through the **anus**. Ring-shaped sphincter (SFINK-ter) muscles around the anus keeps stool from coming out until they relax during a bowel movement.

### Types of cancer in the colon and rectum

**Adenocarcinomas** make up about 96% of colorectal cancers. These cancers start in cells that make mucus to lubricate the inside of the colon and rectum. When doctors talk about colorectal cancer, they're almost always talking about this type. Some sub-types of adenocarcinoma, such as signet ring and mucinous, may have a worse prognosis

(outlook).

Other, much less common types of tumors can start in the colon and rectum, too. These include:

- **Carcinoid tumors.** These start from special hormone-making cells in the intestine. They're covered in [Gastrointestinal Carcinoid Tumors](#)<sup>4</sup>.
- **Gastrointestinal stromal tumors (GISTs)** start from special cells in the wall of the colon called the *interstitial cells of Cajal*. Some are not cancer (benign). These tumors can be found anywhere in the digestive tract, but are not common in the colon. They're discussed in [Gastrointestinal Stromal Tumor \(GIST\)](#)<sup>5</sup>.
- **Lymphomas** are cancers of immune system cells. They mostly start in [lymph nodes](#)<sup>6</sup>, but they can also start in the colon, rectum, or other organs. Information on lymphomas of the digestive system can be found in [Non-Hodgkin Lymphoma](#)<sup>7</sup>.
- **Sarcomas** can start in blood vessels, muscle layers, or other connective tissues in the wall of the colon and rectum. Sarcomas of the colon or rectum are rare. They're discussed in [Soft Tissue Sarcoma](#)<sup>8</sup>.

## Hyperlinks

1. [www.cancer.org/cancer/cancer-basics/what-is-cancer.html](http://www.cancer.org/cancer/cancer-basics/what-is-cancer.html)
2. [www.cancer.org/treatment/understanding-your-diagnosis/tests/understanding-your-pathology-report/colon-pathology/colon-polyps-sessile-or-traditional-serrated-adenomas.html](http://www.cancer.org/treatment/understanding-your-diagnosis/tests/understanding-your-pathology-report/colon-pathology/colon-polyps-sessile-or-traditional-serrated-adenomas.html)
3. [www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/staged.html](http://www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/staged.html)
4. [www.cancer.org/cancer/gastrointestinal-carcinoid-tumor.html](http://www.cancer.org/cancer/gastrointestinal-carcinoid-tumor.html)
5. [www.cancer.org/cancer/gastrointestinal-stromal-tumor.html](http://www.cancer.org/cancer/gastrointestinal-stromal-tumor.html)
6. [www.cancer.org/cancer/cancer-basics/lymph-nodes-and-cancer.html](http://www.cancer.org/cancer/cancer-basics/lymph-nodes-and-cancer.html)
7. [www.cancer.org/cancer/non-hodgkin-lymphoma.html](http://www.cancer.org/cancer/non-hodgkin-lymphoma.html)
8. [www.cancer.org/cancer/soft-tissue-sarcoma.html](http://www.cancer.org/cancer/soft-tissue-sarcoma.html)

## References

American Cancer Society. *Colorectal Cancer Facts & Figures 2017-2019*. Atlanta, Ga: American Cancer Society; 2017.

Libutti SK, Salz LB, Willett CG, Levine RA. Chapter 57: Cancer of the colon. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

Libutti SK, Willett CG, Salz LB, Levine RA. Chapter 60: Cancer of the rectum. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

Sigurdson ER, Benson AB, Minsky B. Cancer of the rectum. In: Niederhuber JE, Armitage JO, Dorshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5th ed. Philadelphia, Pa. Elsevier: 2014: 1336-1359.

Steele SR, Johnson EK, Champagne B et al. Endoscopy and polyps-diagnostic and therapeutic advances in management. *World J Gastroenterol* 2013; 19(27): 4277-4288.

Van Schaeybroeck S, Lawler M, Johnston B, et al. Colorectal cancer. In: Neiderhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5<sup>th</sup> ed. Philadelphia, Pa: Elsevier; 2014: 1278-1335.

Last Medical Review: February 21, 2018 Last Revised: February 21, 2018

---

## Key Statistics for Colorectal Cancer

### How common is colorectal cancer?

Excluding skin cancers, colorectal cancer is the third most common cancer diagnosed in both men and women in the United States. The American Cancer Society's estimates for the number of colorectal cancer cases in the United States for 2019 are:

- 101,420 new cases of colon cancer
- 44,180 new cases of rectal cancer

### Lifetime risk of colorectal cancer

Overall, the lifetime risk of developing colorectal cancer is: about 1 in 22 (4.49%) for men and 1 in 24 (4.15%) for women. This risk is slightly lower in women than in men. A number of other factors (described in [Colorectal Cancer Risk Factors](#)<sup>1</sup>) can also affect your risk for developing colorectal cancer.

## Deaths from colorectal cancer

In the United States, colorectal cancer is the third leading cause of cancer-related deaths in men and in women, and the second most common cause of cancer deaths when men and women are combined. It's expected to cause about **51,020 deaths during 2019**.

The death rate (the number of deaths per 100,000 people per year) from colorectal cancer has been dropping in both men and women for several decades. There are a number of likely reasons for this. One is that colorectal polyps are now being found more often by [screening](#)<sup>2</sup> and removed before they can develop into cancers or are being found earlier when the disease is easier to treat. In addition, treatment for colorectal cancer has improved over the last few decades. As a result, there are now more than 1 million survivors of colorectal cancer in the United States. Although the overall death rate has continued to drop, deaths from colorectal cancer among people younger than age 55 have increased 1% per year from 2007 and 2016.

Statistics related to survival among people with colorectal cancer are discussed in [Survival Rates for Colorectal Cancer, by Stage](#)<sup>3</sup>

Visit the [American Cancer Society's Cancer Statistics Center](#)<sup>4</sup> for more key statistics.

## Hyperlinks

1. [www.cancer.org/cancer/colon-rectal-cancer/causes-risks-prevention/risk-factors.html](http://www.cancer.org/cancer/colon-rectal-cancer/causes-risks-prevention/risk-factors.html)
2. [www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/screening-tests-used.html](http://www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/screening-tests-used.html)
3. [www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/survival-rates.html](http://www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/survival-rates.html)
4. <https://cancerstatisticscenter.cancer.org/>

## References

American Cancer Society. *Cancer Facts & Figures 2019*. Atlanta, Ga: American Cancer Society; 2019.

Howlander N, Noone AM, Krapcho M, Miller D, Bishop K, Altekruse SF, Kosary CL, Yu M, Ruhl J, Tatalovich Z, Mariotto A, Lewis DR, Chen HS, Feuer EJ, Cronin KA (eds). SEER Cancer Statistics Review, 1975-2013, National Cancer Institute. Bethesda, MD, [http://seer.cancer.gov/csr/1975\\_2013/](http://seer.cancer.gov/csr/1975_2013/), based on November 2015 SEER data submission, posted to the SEER web site, April 2016.

Lifetime Risk (Percent) of Being Diagnosed with Cancer by Site and Race/Ethnicity:

Males, 18 SEER Areas, 2011-2013 (Table 1.16)

[http://seer.cancer.gov/csr/1975\\_2013/browse\\_csr.php?sectionSEL=1&pageSEL=sect\\_01\\_table.16.html](http://seer.cancer.gov/csr/1975_2013/browse_csr.php?sectionSEL=1&pageSEL=sect_01_table.16.html)

Females, 18 SEER Areas, 2011-2013 (Table 1.17)

[http://seer.cancer.gov/csr/1975\\_2013/browse\\_csr.php?sectionSEL=1&pageSEL=sect\\_01\\_table.17.html](http://seer.cancer.gov/csr/1975_2013/browse_csr.php?sectionSEL=1&pageSEL=sect_01_table.17.html). Accessed on April 5, 2017.

Libutti SK, Salz LB, Willett CG, Levine RA. Chapter 57: Cancer of the colon. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

Van Schaeybroeck S, Lawler M, Johnston B, et al. Ch. 77 Colorectal cancer. In: Neiderhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5<sup>th</sup> ed. Philadelphia, Pa: Elsevier; 2014.

Last Medical Review: February 21, 2018 Last Revised: January 24, 2019

---

## What's New in Colorectal Cancer Research?

Research is always going on in the area of [colorectal cancer](#). Scientists are looking for causes and ways to prevent colorectal cancer, better ways to find it early (when it's small and easier to treat), and ways to improve treatments. Here are some examples of



current research. Treatment in a [clinical trial](#)<sup>1</sup> is often the only way to get these treatments.

## Reducing colorectal cancer risk

Many studies are looking to identify the [causes of colorectal cancer](#)<sup>2</sup>. The hope is that this might lead to new ways to help prevent it.

Other studies are looking to see if certain types of diets, dietary supplements, or medicines can lower a person's risk of colorectal cancer. For example, many studies have shown that aspirin and pain relievers like it might help lower the risk of colorectal cancer, but these drugs can have serious side effects. Researchers are now trying to figure out if the benefits might outweigh the risks for certain groups of people thought to be at high colorectal cancer risk.

## Early detection

Doctors are looking for better ways to find [colorectal cancer early](#)<sup>3</sup> by studying new types of screening tests (like blood tests) and improving the ones already being used. Researchers are also trying to figure out if there's any test or screening plan that clearly works best.

They're also looking for ways to educate and encourage people to get the routine [screening tests](#)<sup>4</sup> that are available today and known to help reduce the number of deaths from this cancer.

## Diagnosis

Researchers are trying to define colorectal cancer sub-types. This means grouping colorectal cancers based on things like the genetic mutations in the cancer cells, how the cells look and behave, how fast the cells are dividing, and features of the tumor itself. As has been found with other cancer types, this might lead to better understanding of disease progression and outcomes, as well as more clearly defined treatment plans (precision medicine).

## Lab tests to help plan treatment

Lab tests have been developed to help predict which patients have a higher risk of colorectal cancer recurrence (the cancer coming back after treatment). These tests

look at different genes inside the person's colorectal cancer cells. These tests are being studied to see if they might help decide which treatment plan is best for each person. They might also be helpful in deciding if more treatment is needed after surgery.

As doctors continue to learn more about the genetic changes in colorectal cancer cells, they're also looking for better ways to predict outcomes and adjust treatment plans for each patient. Early studies have already shown that certain cancer cell changes can affect the response to certain chemo drugs, but more research is needed. Identifying changes that are only found in the cancer cells could also lead to better screening tests that look for these specific changes.

## Treatment

Researchers are always looking for better ways to treat colorectal cancer.

### Surgery

Surgeons continue to improve the [operations used for colorectal cancers](#)<sup>5</sup>. Research looking at the benefits of [laparoscopic and robotic](#)<sup>6</sup> surgeries compared to open surgeries (where bigger cuts are made in the skin) is common. Rectal cancer [surgery done through the anus](#)<sup>7</sup>, without cutting the skin, is also being studied.

Organ preservation -- keeping your body working the way it normally does -- is another research goal. For instance:

- Doctors are looking at the ideal timing of surgery after chemo is used to shrink a rectal tumor and how to know when they've got the best response in each patient.
- Studies are also looking for better ways to reattach the ends of the colon after the length with the tumor has been removed.
- Surgery that saves the anal sphincter muscle that controls the passing of stool is a rectal cancer research interest.

Sometimes when colorectal cancer recurs (comes back), it spreads to the peritoneum (the thin lining of the abdominal cavity and organs inside the abdomen). These cancers are often hard to treat. Surgeons have been studying a procedure called **hyperthermic intraperitoneal chemotherapy (HIPEC)**. First, surgery is done to remove as much of the cancer in the belly as possible. Then, while still in the operating room, the abdominal cavity is bathed in heated chemotherapy drugs. This puts the chemo right into contact with the cancer cells, and the heat is thought to help the drugs work better. Some patients are living longer with this type of treatment, but more studies are needed to

know which patients it can help. Doctors and nurses with special training and specialized equipment are needed, so it's not widely available.

## Chemotherapy

[Chemotherapy](#)<sup>8</sup> is an important part of treatment for many people with colorectal cancer, and doctors are constantly trying to make it more effective and safer. Different approaches are being tested in clinical trials, including:

- Testing new chemo drugs or drugs that are already used against other cancers.
- Looking for new ways to combine drugs already known to work against colorectal cancer to see if they work better together.
- Studying the best ways to combine chemotherapy with radiation therapy, targeted therapies, and/or immunotherapy.

Better ways to identify, prevent, and treat chemo [side effects](#)<sup>9</sup> are other areas of research interest.

## Targeted therapy

[Targeted therapy](#)<sup>10</sup> drugs work differently from standard chemotherapy drugs. They affect specific parts of cancer cells that make them different from normal cells. Several [targeted therapy drugs](#)<sup>11</sup> are already used to treat advanced colorectal cancer. Researchers are studying the best way to give these drugs and looking for new targeted therapy drugs. Studies are also looking at colorectal cancer cells to try to find specific gene changes (mutations) that might be targeted as part of treatment.

Studies are being done to see if using targeted therapy along with chemotherapy in earlier-stage cancers can help reduce the risk of recurrence.

## Immunotherapy

An exciting area of research is the field of [immunotherapy](#)<sup>12</sup>. This is treatment that uses the body's own immune system to fight cancer.

**Immune checkpoint inhibitors:** An important part of the immune system is its ability to tell between normal cells in the body and those it sees as "foreign." This lets the immune system attack the foreign cells while leaving the normal cells alone. To do this, it uses "checkpoint" proteins on certain immune cells. These proteins act like switches, needing to be turned on (or off) to start an immune response. Cancer cells sometimes

use these checkpoints to keep from being attacked by the immune system.

Newer drugs that target checkpoint proteins hold a lot of promise as cancer treatments. Colorectal cancer cells that have specific gene changes, such as high levels of microsatellite instability (MSI-H), or changes in one of the mismatch repair (MMR) genes, tend to have a lot of other changes that make them different from normal colorectal cells. This might make them more visible to the immune system. Studies are looking at whether cancers with these changes are being helped by treatment with new drugs that focus on these cell changes.

**Cancer vaccines:** Researchers are studying several vaccines to try to treat colorectal cancer or keep it from coming back after treatment. Unlike vaccines that prevent infectious diseases, these vaccines are meant to boost the person's immune system to better find and fight colorectal cancer cells.

Many types of vaccines are being studied. For example, some vaccines are created by removing some of the person's own immune system cells (called *dendritic cells*) from the tumor, treating them with a substance that will help them find and attack cancer cells, and then putting them back into the person's body.

## Hyperlinks

1. [www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html](http://www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html)
2. [www.cancer.org/cancer/colon-rectal-cancer/causes-risks-prevention/what-causes.html](http://www.cancer.org/cancer/colon-rectal-cancer/causes-risks-prevention/what-causes.html)
3. [www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/detection.html](http://www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/detection.html)
4. [www.cancer.org/healthy/find-cancer-early/cancer-screening-guidelines/american-cancer-society-guidelines-for-the-early-detection-of-cancer.html](http://www.cancer.org/healthy/find-cancer-early/cancer-screening-guidelines/american-cancer-society-guidelines-for-the-early-detection-of-cancer.html)
5. [www.cancer.org/cancer/colon-rectal-cancer/treating.html](http://www.cancer.org/cancer/colon-rectal-cancer/treating.html)
6. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/surgery/special-surgical-techniques.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/surgery/special-surgical-techniques.html)
7. [www.cancer.org/cancer/colon-rectal-cancer/treating/rectal-surgery.html](http://www.cancer.org/cancer/colon-rectal-cancer/treating/rectal-surgery.html)
8. [www.cancer.org/cancer/colon-rectal-cancer/treating/chemotherapy.html](http://www.cancer.org/cancer/colon-rectal-cancer/treating/chemotherapy.html)
9. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html)
10. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/targeted-therapy.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/targeted-therapy.html)
11. [www.cancer.org/cancer/colon-rectal-cancer/treating/targeted-therapy.html](http://www.cancer.org/cancer/colon-rectal-cancer/treating/targeted-therapy.html)
12. [www.cancer.org/cancer/colon-rectal-cancer/treating/immunotherapy.html](http://www.cancer.org/cancer/colon-rectal-cancer/treating/immunotherapy.html)

**References** LN, Liang H, Collins D, Yale SH. Colorectal Cancer Screening. *WMJ*. 2017;116(1):27-33.

Mahasneh A, Al-Shaheri F, Jamal E. Molecular biomarkers for an early diagnosis, effective treatment and prognosis of colorectal cancer: Current updates. *Exp Mol Pathol.* 2017;102(3):475-483.

Roseweir AK, McMillan DC, Horgan PG, Edwards J. Colorectal cancer subtypes: Translation to routine clinical pathology. *Cancer Treatment Reviews*, Volume 57. 2017, pp. 1-7.

São Julião GP, Habr-Gama A, Vailati BB, et al. New Strategies in Rectal Cancer. *Surg Clin North Am.* 2017;97(3):587-604.

Wright M, Beaty JS, Ternent CA. Molecular Markers for Colorectal Cancer. *Surg Clin North Am.* 2017;97(3):683-701.

Last Medical Review: February 21, 2018 Last Revised: February 21, 2018

### **Written by**

The American Cancer Society medical and editorial content team  
([www.cancer.org/cancer/acs-medical-content-and-news-staff.html](http://www.cancer.org/cancer/acs-medical-content-and-news-staff.html))

Our team is made up of doctors and oncology certified nurses with deep knowledge of cancer care as well as journalists, editors, and translators with extensive experience in medical writing.

American Cancer Society medical information is copyrighted material. For reprint requests, please see our Content Usage Policy ([www.cancer.org/about-us/policies/content-usage.html](http://www.cancer.org/about-us/policies/content-usage.html)).

**cancer.org | 1.800.227.2345**



[cancer.org](https://www.cancer.org) | 1.800.227.2345

---

# Colorectal Cancer Causes, Risk Factors, and Prevention

## Risk Factors

A risk factor is anything that affects your chance of getting a disease such as cancer. Learn more about the risk factors for colorectal cancer.

- [Colorectal Cancer Risk Factors](#)
- [What Causes Colorectal Cancer?](#)

## Prevention

There's no way to completely prevent cancer. But there are things you can do that might help lower your risk. Learn more.

- [Can Colorectal Cancer Be Prevented?](#)
- [Genetic Testing, Screening, and Prevention for People with a Strong Family History of Colorectal Cancer](#)

---

# Colorectal Cancer Risk Factors

A risk factor is anything that affects your chance of getting a disease such as cancer. Different cancers have different risk factors. Some risk factors, like smoking, can be changed. Others, like a person's age or family history, can't be changed.

But having a risk factor, or even many, does not mean that you will get the disease. And some people who get the disease may not have any known risk factors.

Researchers have found several risk factors that might increase a person's chance of developing [colorectal polyps or colorectal cancer](#)<sup>1</sup>.

## Colorectal cancer risk factors you can change

Many lifestyle-related factors have been linked to colorectal cancer. In fact, the links between diet, weight, and exercise and colorectal cancer risk are some of the strongest for any type of cancer.

### Being overweight or obese

If you are [overweight or obese](#)<sup>2</sup> (very overweight), your risk of developing and dying from colorectal cancer is higher. Being overweight (especially having a larger waistline) raises the risk of colon and rectal cancer in both men and women, but the link seems to be stronger in men.

### Physical inactivity

If you're not physically active, you have a greater chance of developing colon cancer. [Being more active](#)<sup>3</sup> can help lower your risk.

### Certain types of diets

A diet that's high in red meats (such as beef, pork, lamb, or liver) and processed meats (like hot dogs and some luncheon meats) raises your colorectal cancer risk.

Cooking meats at very high temperatures (frying, broiling, or grilling) creates chemicals that might raise your cancer risk. It's not clear how much this might increase your colorectal cancer risk.

It's not clear if other dietary components (for example, certain types of fats) affect colorectal cancer risk.

### Smoking

People who have smoked tobacco for a long time are more likely than non-smokers to develop and die from colorectal cancer. [Smoking](#)<sup>4</sup> is a well-known cause of [lung](#)

[cancer](#)<sup>5</sup>, but it's linked to a lot of [other cancers](#)<sup>6</sup>, too. If you smoke and want to know more about quitting, see our [Guide to Quitting Smoking](#)<sup>8</sup>.

## Heavy alcohol use

Colorectal cancer has been linked to moderate to heavy [alcohol](#)<sup>9</sup> use. Limiting alcohol use to no more than 2 drinks a day for men and 1 drink a day for women could have many health benefits, including a lower risk of [many kinds of cancer](#)<sup>10</sup>.

## Colorectal cancer risk factors you cannot change

### Being older

Your risk of colorectal cancer goes up as you age. Younger adults can get it, but it's much more common after age 50.

### A personal history of colorectal polyps or colorectal cancer

If you have a history of [adenomatous polyps](#)<sup>11</sup> (adenomas), you are at increased risk of developing colorectal cancer. This is especially true if the polyps are large, if there are many of them, or if any of them show dysplasia.

If you've had colorectal cancer, even though it was completely removed, you are more likely to develop new cancers in other parts of the colon and rectum. The chances of this happening are greater if you had your first colorectal cancer when you were younger.

### A personal history of inflammatory bowel disease

If you have inflammatory bowel disease (IBD), including either ulcerative colitis or Crohn's disease, your risk of colorectal cancer is increased.

IBD is a condition in which the colon is inflamed over a long period of time. People who have had IBD for many years, especially if untreated, often develop *dysplasia*. Dysplasia is a term used to describe cells in the lining of the colon or rectum that look abnormal, but are not true cancer cells. They can change into cancer over time.

If you have IBD, you may need to start getting screened for colorectal cancer when you are younger and be screened more often.



Inflammatory bowel disease is different from irritable bowel syndrome (IBS), which does not increase your risk for colorectal cancer.

### **A family history of colorectal cancer or adenomatous polyps**

Most colorectal cancers are found in people *without* a family history of colorectal cancer. Still, nearly 1 in 3 people who develop colorectal cancer have other family members who have had it.

People with a history of colorectal cancer in a first-degree relative (parent, sibling, or child) are at increased risk. The risk is even higher if that relative was diagnosed with cancer when they were younger than 45, or if more than one first-degree relative is affected.

The reasons for the increased risk are not clear in all cases. Cancers can “run in the family” because of inherited genes, shared environmental factors, or some combination of these.

Having family members who have had adenomatous polyps is also linked to a higher risk of colon cancer. (Adenomatous polyps are the kind of polyps that can become cancer.)

If you have a family history of adenomatous polyps or colorectal cancer, talk with your doctor about the possible need to start screening before age 45. If you've had adenomatous polyps or colorectal cancer, it's important to tell your close relatives so that they can pass along that information to their doctors and start screening at the right age.

### **Having an inherited syndrome**

About 5% of people who develop colorectal cancer have inherited [gene](#)<sup>12</sup> changes (mutations) that cause [family cancer syndromes](#)<sup>13</sup> and can lead to them getting the disease.

The most common inherited syndromes linked with colorectal cancers are Lynch syndrome (hereditary non-polyposis colorectal cancer, or HNPCC) and familial adenomatous polyposis (FAP), but other rarer syndromes can increase colorectal cancer risk, too.

### ***Lynch syndrome (hereditary non-polyposis colon cancer or HNPCC)***

Lynch syndrome is the most common hereditary colorectal cancer syndrome. It accounts for about 2% to 4% of all colorectal cancers. In most cases, this disorder is caused by an inherited defect in either the *MLH1* or *MSH2* gene, but changes in other genes can also cause Lynch syndrome. These genes normally help repair DNA that has been damaged.

The cancers linked to this syndrome tend to develop when people are relatively young. People with Lynch syndrome can have polyps, but they tend to only have a few. The lifetime risk of colorectal cancer in people with this condition may be as high as 80%, but this depends on which gene is affected.

Women with this condition also have a very high risk of developing cancer of the endometrium (lining of the uterus). Other cancers linked with Lynch syndrome include cancer of the ovary, stomach, small intestine, pancreas, kidney, prostate, breast, brain, ureters (tubes that carry urine from the kidneys to the bladder), and bile duct.

For more on Lynch syndrome, see [What Causes Colorectal Cancer?](#), [Can Colorectal Cancer Be Prevented?](#), and [Family Cancer Syndromes](#)<sup>14</sup>.

### ***Familial adenomatous polyposis (FAP)***

FAP is caused by changes (mutations) in the *APC* gene that a person inherits from his or her parents. About 1% of all colorectal cancers are caused by FAP.

In the most common type of FAP, hundreds or thousands of polyps develop in a person's colon and rectum, often starting at ages 10 to 12 years. Cancer usually develops in 1 or more of these polyps as early as age 20. By age 40, almost all people with FAP will have colon cancer if their colon hasn't been removed to prevent it. People with FAP also have an increased risk for cancers of the stomach, small intestines, pancreas, liver, and some other organs.

There are 3 sub-types of FAP:

- In **attenuated FAP** or **AFAP**, patients have fewer polyps (less than 100), and colorectal cancer tends to occur at a later age.
- **Gardner syndrome** is a type of FAP that also causes non-cancer tumors of the skin, soft tissue, and bones.
- **Turcot syndrome** is a very rare inherited condition in which people have a higher risk of many adenomatous polyps and colorectal cancer, as well as brain cancer. There are actually 2 types of Turcot syndrome:

### ***Rare inherited syndromes linked to colorectal cancer***

- **Peutz-Jeghers syndrome (PJS):** People with this inherited condition tend to have freckles around the mouth (and sometimes on their hands and feet) and a special type of polyp called *hamartomas* in their digestive tracts. These people are at a much higher risk for colorectal cancer, as well as other cancers, and they usually are diagnosed at a younger than usual age. This syndrome is caused by mutations in the *STK11 (LKB1)* gene.
- **MYH-associated polyposis (MAP):** People with this syndrome develop many colon polyps. These will almost always become cancer if not watched closely with regular colonoscopies. These people also have an increased risk of other cancers of the GI (gastrointestinal) tract and thyroid. This syndrome is caused by mutations in the *MYH* gene (which is involved in “proofreading” the DNA and fixing any mistakes) and often leads to cancer at a younger age.

Since many of these syndromes are linked to colorectal cancer at a young age and also linked to other types of cancer, identifying families with these inherited syndromes is important. It lets doctors recommend specific steps such as screening and other preventive measures when the person is younger. Information on risk assessment, and genetic counseling and testing for these syndromes can be found in [Genetic Testing, Screening, and Prevention for People with a Strong Family History of Colorectal Cancer](#).

### **Your racial and ethnic background**

African Americans have the highest colorectal cancer incidence and mortality rates of all racial groups in the US. The reasons for this are not fully understood.

Jews of Eastern European descent (Ashkenazi Jews) have one of the highest colorectal cancer risks of any ethnic group in the world.

### **Having type 2 diabetes**

People with type 2 (usually non-insulin dependent) diabetes have an increased risk of colorectal cancer. Both type 2 diabetes and colorectal cancer share some of the same risk factors (such as being overweight and physical inactivity). But even after taking these factors into account, people with type 2 diabetes still have an increased risk. They also tend to have a less favorable prognosis (outlook) after diagnosis.

## Factors with unclear effects on colorectal cancer risk

### *Night shift work*

Some studies suggest working a night shift regularly may increase the risk of colorectal cancer. It's thought this might be due to changes in levels of melatonin, a hormone that responds to changes in light. More research is needed.

### *Previous treatment for certain cancers*

Some studies have found that men who survive [testicular cancer](#)<sup>15</sup> seem to have a higher rate of colorectal cancer and some other cancers. This might be because of the treatments they have received such as radiation therapy.

Several studies have suggested that men who had radiation therapy to treat [prostate cancer](#)<sup>16</sup> might have a higher risk of rectal cancer because the rectum receives some radiation during treatment. Most of these studies are based on men treated in the 1980s and 1990s, when radiation treatments were less precise than they are today. The effect of more modern radiation methods on rectal cancer risk is not clear.

## Hyperlinks

1. [www.cancer.org/cancer/colon-rectal-cancer/about/what-is-colorectal-cancer.html](http://www.cancer.org/cancer/colon-rectal-cancer/about/what-is-colorectal-cancer.html)
2. [www.cancer.org/cancer/cancer-causes/diet-physical-activity/body-weight-and-cancer-risk.html](http://www.cancer.org/cancer/cancer-causes/diet-physical-activity/body-weight-and-cancer-risk.html)
3. [www.cancer.org/healthy/eat-healthy-get-active.html](http://www.cancer.org/healthy/eat-healthy-get-active.html)
4. [www.cancer.org/healthy/stay-away-from-tobacco.html](http://www.cancer.org/healthy/stay-away-from-tobacco.html)
5. [www.cancer.org/cancer/lung-cancer.html](http://www.cancer.org/cancer/lung-cancer.html)
6. [www.cancer.org/cancer/cancer-causes/tobacco-and-cancer/health-risks-of-smoking-tobacco.html](http://www.cancer.org/cancer/cancer-causes/tobacco-and-cancer/health-risks-of-smoking-tobacco.html)
7. [www.cancer.org/healthy/stay-away-from-tobacco/guide-quitting-smoking.html](http://www.cancer.org/healthy/stay-away-from-tobacco/guide-quitting-smoking.html)
8. [www.cancer.org/healthy/stay-away-from-tobacco/guide-quitting-smoking.html](http://www.cancer.org/healthy/stay-away-from-tobacco/guide-quitting-smoking.html)
9. [www.cancer.org/cancer/cancer-causes/diet-physical-activity/alcohol-use-and-cancer.html](http://www.cancer.org/cancer/cancer-causes/diet-physical-activity/alcohol-use-and-cancer.html)
10. [www.cancer.org/cancer/cancer-causes/diet-physical-activity/alcohol-use-and-cancer.html](http://www.cancer.org/cancer/cancer-causes/diet-physical-activity/alcohol-use-and-cancer.html)
11. [www.cancer.org/cancer/colon-rectal-cancer/about/what-is-colorectal-cancer.html](http://www.cancer.org/cancer/colon-rectal-cancer/about/what-is-colorectal-cancer.html)
12. [www.cancer.org/cancer/cancer-causes/genetics/genes-and-cancer.html](http://www.cancer.org/cancer/cancer-causes/genetics/genes-and-cancer.html)
13. [www.cancer.org/cancer/cancer-causes/genetics/family-cancer-syndromes.html](http://www.cancer.org/cancer/cancer-causes/genetics/family-cancer-syndromes.html)

14. [www.cancer.org/cancer/cancer-causes/genetics/family-cancer-syndromes.html](http://www.cancer.org/cancer/cancer-causes/genetics/family-cancer-syndromes.html)
15. [www.cancer.org/cancer/testicular-cancer.html](http://www.cancer.org/cancer/testicular-cancer.html)
16. [www.cancer.org/cancer/prostate-cancer.html](http://www.cancer.org/cancer/prostate-cancer.html)

## References

American Cancer Society. *Cancer Facts & Figures 2017*. Atlanta, Ga: American Cancer Society; 2017.

American Cancer Society. *Colorectal Cancer Facts & Figures 2017-2019*. Atlanta, Ga: American Cancer Society; 2017.

American Society of Clinical Oncology. *Familial Adenomatous Polyposis*, 5/2017. Accessed at [www.cancer.net/cancer-types/familial-adenomatous-polyposis](http://www.cancer.net/cancer-types/familial-adenomatous-polyposis) on January 31, 2018.

American Society of Clinical Oncology. *Lynch Syndrome*, 5/2017. Accessed at [www.cancer.net/cancer-types/lynch-syndrome/cilynch-syndromeprinter](http://www.cancer.net/cancer-types/lynch-syndrome/cilynch-syndromeprinter) on January 31, 2018.

American Society of Clinical Oncology. *MYH-Associated Polyposis*, 5/2017. Accessed at [www.cancer.net/cancer-types/myh-associated-polyposis](http://www.cancer.net/cancer-types/myh-associated-polyposis) on January 31, 2018.

Ballester V, Rashtak S, Boardman L. Clinical and molecular features of young-onset colorectal cancer. *World J Gastroenterol*. 2016; 22(5):1736-1744.

Johns LE, Houlston RS. A systematic review and meta-analysis of familial colorectal cancer risk. *Am J Gastroenterol*. 2001;96:2992-3003.

Libutti SK, Salz LB, Willett CG, Levine RA. Chapter 57: Cancer of the colon. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

Lynch HT, de la Chapelle A. Hereditary colorectal cancer. *N Engl J Med*. 2003;348:919–932.

Mazonakis M, Varveris C, Lyraraki E, Damilakis J. Radiotherapy for stage I seminoma of the testis: Organ equivalent dose to partially in-field structures and second cancer risk estimates on the basis of a mechanistic, bell-shaped, and plateau model. *Med*

*Phys.* 2015;42(11):6309-6316.

National Center for Advancing Translational Sciences. Genetic and Rare Diseases Information Center. *MYH-associated polyposis*, 6/28/2011. Accessed at <https://rarediseases.info.nih.gov/diseases/10805/myh-associated-polyposis> on January 31, 2018.

National Center for Advancing Translational Sciences. Genetic and Rare Diseases Information Center. *Peutz-Jeghers syndrome*, 3/15/2015. Accessed at <https://rarediseases.info.nih.gov/diseases/7378/peutz-jeghers-syndrome> on January 31, 2018.

National Center for Advancing Translational Sciences. Genetic and Rare Diseases Information Center. *Turcot syndrome*, 8/29/2012. Accessed at <https://rarediseases.info.nih.gov/diseases/420/turcot-syndrome> on January 31, 2018.

National Comprehensive Cancer Network Clinical Practice Guidelines in Oncology (NCCN Guidelines). *Genetic/Familial High-Risk Assessment: Colorectal, Version 3.2017*. Accessed at [www.nccn.org/professionals/physician\\_gls/pdf/genetics\\_colon.pdf](http://www.nccn.org/professionals/physician_gls/pdf/genetics_colon.pdf) on January 31, 2018.

Nielsen M, Lynch H, Infante E, et al. MUTYH-Associated Polyposis. 2012 Oct 4 [Updated 2015 Sep 24]. In: Pagon RA, Adam MP, Ardinger HH, et al., editors. *GeneReviews® [Internet]*. Seattle (WA): University of Washington, Seattle; 1993-2017. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK107219/>.

Parent ME, El-Zein M, Rousseau MC, et al. Night Work and the Risk of Cancer Among Men. *Am J Epidemiol.* 2012; 176(9):751-759.

Van Schaeybroeck S, Lawler M, Johnston B, et al. Ch. 77 Colorectal cancer. In: Neiderhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5<sup>th</sup> ed. Philadelphia, Pa: Elsevier; 2014.

Last Medical Review: February 21, 2018 Last Revised: February 21, 2018

---

## What Causes Colorectal Cancer?

Researchers have found several [factors that can increase a person's risk of colorectal cancer](#), but it's not yet clear exactly how all of these factors might cause this cancer.

Cancer is caused by changes in the DNA inside our cells. DNA is the chemical in our cells that makes up our genes, which control how our cells function. We usually look like our parents because they are the source of our DNA. But DNA affects more than just how we look.

Some genes help control when our cells grow, divide into new cells, and die:

- Certain genes that help cells grow, divide, and stay alive are called *oncogenes*.
- Genes that help keep cell division under control or cause cells to die at the right time are called *tumor suppressor genes*.

Cancers can be caused by DNA mutations (changes) that turn on oncogenes or turn off tumor suppressor genes. This leads to cells growing out of control. Changes in many different genes are usually needed to cause colorectal cancer.

For more about how genes changes can lead to cancer, see [Genes and Cancer](#)<sup>1</sup>.

## Inherited gene mutations

Some DNA mutations can be passed on in families and are found in all of a person's cells. These are called *inherited* mutations. . A very small portion of colorectal cancers are caused by inherited gene mutations. Many of these DNA changes and their effects on the growth of cells are now known. For example:

- **Familial adenomatous polyposis (FAP), attenuated FAP (AFAP), and Gardner syndrome** are caused by inherited changes in the *APC* gene. The *APC* gene is a tumor suppressor gene; it normally helps keep cell growth in check. In people with inherited changes in the *APC* gene, this “brake” on cell growth is turned off, causing hundreds of polyps to form in the colon. Over time, cancer will nearly always develop in one or more of these polyps.
- **Lynch syndrome (hereditary non-polyposis colon cancer, or HNPCC)** is caused by changes in genes that normally help a cell repair damaged DNA. A mutation in one of the DNA repair enzyme genes like *MLH1*, *MSH2*, *MLH3*, *MSH6*, *PMS1*, and *PMS2*, can allow DNA errors to go unfixed. These errors will sometimes affect growth-regulating genes, which may lead to the development of cancer.
- **Peutz-Jeghers syndrome** is caused by inherited changes in the



*STK11 (LKB1)* gene, a tumor suppressor gene.

- **MYH-associated polyposis (MAP)** is caused by mutations in the *MYH* gene, which is involved in how the cell “proofreads” or checks the DNA and fixes errors when cells divide.

Special genetic tests can find gene mutations linked to these inherited syndromes. If you have a family history of colorectal polyps or cancer or other symptoms linked to these syndromes, you may want to ask your doctor about genetic counseling and genetic testing. The American Cancer Society recommends discussing genetic testing with a qualified cancer genetics professional before any genetic testing is done. For more on this, see [Understanding Genetic Testing for Cancer](#)<sup>2</sup> and [What Happens during Genetic Testing for Cancer?](#)<sup>3</sup>

## Acquired gene mutations

Most gene mutations that lead to cancer are *acquired* mutations. They happen during a person’s lifetime and are not passed on to their children. These DNA changes affect only cells that come from the original mutated cell.

In most cases of colorectal cancer, the DNA mutations that lead to cancer are acquired during a person’s life rather than having been inherited. Certain [risk factors](#) probably play a role in causing these acquired mutations, but so far it’s not known what causes most of them.

There doesn’t seem to be a single genetic pathway to colorectal cancer that’s the same in all cases. In many cases, the first mutation occurs in the *APC* gene. This leads to an increased growth of colorectal cells because of the loss of this “brake” on cell growth. Further mutations may then occur in other genes, which can lead the cells to grow and spread uncontrollably. Other genes that aren’t known yet are probably involved as well.

## Hyperlinks

1. [www.cancer.org/cancer/cancer-causes/genetics/genes-and-cancer.html](http://www.cancer.org/cancer/cancer-causes/genetics/genes-and-cancer.html)
2. [www.cancer.org/cancer/cancer-causes/genetics/understanding-genetic-testing-for-cancer.html](http://www.cancer.org/cancer/cancer-causes/genetics/understanding-genetic-testing-for-cancer.html)
3. [www.cancer.org/cancer/cancer-causes/genetics/what-happens-during-genetic-testing-for-cancer.html](http://www.cancer.org/cancer/cancer-causes/genetics/what-happens-during-genetic-testing-for-cancer.html)



## References

Libutti SK, Salz LB, Willett CG, Levine RA. Chapter 57: Cancer of the colon. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

National Center for Advancing Translational Sciences. Genetic and Rare Diseases Information Center. Peutz-Jeghers syndrome, 3/15/2015. Accessed at <https://rarediseases.info.nih.gov/diseases/7378/peutz-jeghers-syndrome> on January 31, 2018.

National Center for Advancing Translational Sciences. Genetic and Rare Diseases Information Center. Turcot syndrome, 8/29/2012. Accessed at <https://rarediseases.info.nih.gov/diseases/420/turcot-syndrome> on January 31, 2018.

National Comprehensive Cancer Network Clinical Practice Guidelines in Oncology (NCCN Guidelines). Genetic/Familial High-Risk Assessment: Colorectal, Version 3.2017. Accessed at [www.nccn.org/professionals/physician\\_gls/pdf/genetics\\_colon.pdf](http://www.nccn.org/professionals/physician_gls/pdf/genetics_colon.pdf) on January 31, 2018.

Van Schaeybroeck S, Lawler M, Johnston B, et al. Ch. 77 Colorectal cancer. In: Neiderhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5<sup>th</sup> ed. Philadelphia, Pa: Elsevier; 2014.

Last Medical Review: February 21, 2018 Last Revised: February 21, 2018

---

## Can Colorectal Cancer Be Prevented?

There's no sure way to prevent colorectal cancer. But there are things you can do that might help lower your risk, such as changing the [risk factors](#) that you can control.

### Colorectal cancer screening

Screening is the process of looking for cancer or pre-cancer in people who have no symptoms of the disease. Regular colorectal cancer screening is one of the most powerful weapons for preventing colorectal cancer.

From the time the first abnormal cells start to grow into polyps, it usually takes about 10 to 15 years for them to develop into colorectal cancer. With regular screening, most polyps can be found and removed before they have the chance to turn into cancer. Screening can also [find colorectal cancer early](#)<sup>1</sup>, when it's small and easier to treat.

If you're age 45 or older, you should start getting screened for colorectal cancer. Several types of tests can be used. Talk to your health care provider about which ones might be good options for you. No matter which test you choose, the most important thing is to get tested.

If you have a strong family history of colorectal polyps or cancer, talk with your doctor about your risk. You might benefit from [genetic counseling](#)<sup>2</sup> to review your family medical tree to see how likely it is that you have a [family cancer syndrome](#).<sup>3</sup>

## Body weight, physical activity, and diet

You might be able to lower your risk of colorectal cancer by managing some of the [risk factors that you can control](#), like diet and physical activity.

**Weight:** Being overweight or obese increases the risk of colorectal cancer in both men and women, but the link seems to be stronger in men. Having more belly fat (that is, a larger waistline) has also been linked to colorectal cancer. **Staying at a healthy weight and avoiding weight gain around the midsection may help lower your risk.**

**Physical activity:** Increasing your level of activity lowers your risk of colorectal cancer and polyps. Regular moderate activity (doing things that make you breathe as hard as you would during a brisk walk) lowers the risk, but vigorous activity might have an even greater benefit. **Increasing the intensity and amount of your physical activity may help reduce your risk.**

**Diet:** Overall, diets that are high in vegetables, fruits, and whole grains (and low in red and processed meats) have been linked with lower colorectal cancer risk, although it's not exactly clear which factors are important. Many studies have found a link between red meats (beef, pork, and lamb) or processed meats (such as hot dogs, sausage, and lunch meats) and increased colorectal cancer risk. **Limiting red and processed meats and eating more vegetables and fruits may help lower your risk.**

In recent years, some large studies have suggested that fiber in the diet, especially from whole grains, may lower colorectal cancer risk. Research in this area is still under way.

**Alcohol:** Several studies have found a higher risk of colorectal cancer with increased [alcohol intake](#)<sup>4</sup>, especially among men. **Avoiding excess alcohol may help reduce your risk.**

For more about diet and physical activity, see the [American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention](#)<sup>5</sup>.

## Not smoking

Long-term smoking is linked to an increased risk of colorectal cancer, as well as many other cancers and health problems. **Quitting smoking may help lower your risk of colorectal cancer and many other types of cancer, too.** If you smoke [and would like help quitting](#)<sup>6</sup>, call the American Cancer Society at 1-800-227-2345.

## Vitamins, calcium, and magnesium

Some studies suggest that taking a daily multi-vitamin containing folic acid, or folate, may lower colorectal cancer risk, but not all studies have found this. In fact, some studies have hinted that folic acid might help existing tumors grow. More research is needed in this area.

Some studies have suggested that vitamin D, which you can get from sun exposure, in certain foods, or in a vitamin pill, might lower colorectal cancer risk. Because of concerns that excess sun exposure can cause skin cancer, most experts do not recommend this as a way to lower colorectal cancer risk at this time. More studies are needed to determine if vitamin D can help prevent colorectal cancer.

Low levels of dietary calcium have been linked with an increased risk of colorectal cancer in some studies. Other studies suggest that increasing calcium intake may lower colorectal cancer risk. Calcium is important for a number of health reasons aside from possible effects on cancer risk. But because of the possible increased risk of prostate cancer in men with high calcium intake, the American Cancer Society does not recommend increasing calcium intake specifically to try to lower colorectal cancer risk.

Calcium and vitamin D might work together to reduce colorectal cancer risk, as vitamin D aids in the body's absorption of calcium. Still, not all studies have found that supplements of these nutrients reduce risk.

A few studies have found a possible link between a diet that's high in magnesium and reduced colorectal cancer risk, especially among women. More research is needed to determine if this link exists.

## Non-steroidal anti-inflammatory drugs (NSAIDs)

Many studies have found that people who regularly take aspirin or other non-steroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen (Motrin, Advil) and naproxen (Aleve), have a lower risk of colorectal cancer and polyps.

But aspirin and other NSAIDs can cause serious or even life-threatening side effects, such as bleeding from stomach irritation or stomach ulcers, which may outweigh the benefits of these medicines for the general public. For this reason, most experts don't recommend taking NSAIDs just to lower colorectal cancer risk if you are someone at average risk.

Still, for some people in their 50s who have a high risk of heart disease, where low-dose aspirin is found to be beneficial, the aspirin may also have the added benefit of reducing the risk of colorectal cancer.

Because aspirin or other NSAIDs can have serious side effects, check with your doctor before starting any of them on a regular basis.

## Hormone replacement therapy for women

Taking estrogen and progesterone after menopause (sometimes called *menopausal hormone therapy* or *combined hormone replacement therapy*) may reduce a woman's risk of developing colorectal cancer, but cancers found in women taking these hormones after menopause may be at a more advanced [stage](#)<sup>7</sup>.

Because taking estrogen and progesterone after menopause can also increase a woman's risk of heart disease, blood clots, and cancers of the breast and lung, it's not commonly recommended just to lower colorectal cancer risk.

If you're considering using menopausal hormone therapy, be sure to discuss the pros and cons with your doctor.

## Hyperlinks

1. </content/cancer/en/cancer/colon-rectal-cancer/early-detection.html>

2. [www.cancer.org/healthy/eat-healthy-get-active.html](http://www.cancer.org/healthy/eat-healthy-get-active.html)
3. [www.cancer.org/cancer/cancer-causes/genetics/family-cancer-syndromes.html](http://www.cancer.org/cancer/cancer-causes/genetics/family-cancer-syndromes.html)
4. [www.cancer.org/cancer/cancer-causes/diet-physical-activity/alcohol-use-and-cancer.html](http://www.cancer.org/cancer/cancer-causes/diet-physical-activity/alcohol-use-and-cancer.html)
5. [www.cancer.org/healthy/eat-healthy-get-active/acs-guidelines-nutrition-physical-activity-cancer-prevention.html](http://www.cancer.org/healthy/eat-healthy-get-active/acs-guidelines-nutrition-physical-activity-cancer-prevention.html)
6. [www.cancer.org/healthy/stay-away-from-tobacco/guide-quitting-smoking.html](http://www.cancer.org/healthy/stay-away-from-tobacco/guide-quitting-smoking.html)
7. [www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/staged.html](http://www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/staged.html)

## References

American Cancer Society. *Colorectal Cancer Facts & Figures 2017-2019*. Atlanta, Ga: American Cancer Society; 2017.

Libutti SK, Salz LB, Willett CG, Levine RA. Chapter 57: Cancer of the colon. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

Libutti SK, Willett CG, Salz LB, Levine RA. Chapter 60: Cancer of the rectum. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

Sigurdson ER, Benson AB, Minsky B. Cancer of the rectum. In: Niederhuber JE, Armitage JO, Dorshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5th ed. Philadelphia, Pa. Elsevier: 2014: 1336-1359.

Steele SR, Johnson EK, Champagne B et al. Endoscopy and polyps-diagnostic and therapeutic advances in management. *World J Gastroenterol* 2013; 19(27): 4277-4288.

Van Schaeybroeck S, Lawler M, Johnston B, et al. Colorectal cancer. In: Neiderhuber JE, Armitage JO, Doroshov JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5<sup>th</sup> ed. Philadelphia, Pa: Elsevier; 2014: 1278-1335.

Last Medical Review: February 21, 2018 Last Revised: May 30, 2018

# Genetic Testing, Screening, and Prevention for People with a Strong Family History of Colorectal Cancer

If you have a family history of colorectal polyps or cancer, you have a higher risk of getting colorectal cancer yourself. This risk can be even higher in people with a strong family history of colorectal cancer. Cancer in close (first-degree) relatives such as parents, brothers, and sisters is most concerning, but cancer in more distant relatives can also be important. Having 2 or more relatives with colorectal cancer is more concerning than having only one relative with it. It's also more concerning if your relatives were diagnosed with cancer at a younger age than usual.

**If you have a family history of colorectal cancer, talk with your doctor.** You might benefit from speaking with a genetic counselor or other health professional who is trained in genetic counseling. They can review your family history to see how likely it is that you have a family cancer syndrome. The counselor can also help you decide if genetic testing is right for you. If you have testing and are found to have an abnormal gene, there might be steps you can take to help lower your risk of colorectal cancer, such as starting routine screening at an earlier age or even having surgery.

But before getting genetic testing, it's important to know ahead of time what the results may or may not tell you about your risk. Genetic testing is not perfect. The tests might not provide clear answers for some people. This is why meeting with a genetic counselor or cancer genetics professional is important before deciding to be tested. To learn more about this, see [Understanding Genetic Testing for Cancer](#)<sup>1</sup> and [What Happens During Genetic Testing for Cancer?](#)<sup>2</sup>

Genetic tests can help show if members of certain families have inherited a high risk of colorectal cancer due to [inherited cancer syndromes](#) such as Lynch syndrome (also known as hereditary non-polyposis colorectal cancer, or HNPCC) or familial adenomatous polyposis (FAP).

In families known to have one of these inherited syndromes, family members who decide not to get tested are still usually advised to start routine screening for colorectal cancer at an early age, and to get screened more often. Family members who are tested and are found not to have the mutated gene may be able to be screened at the same age and frequency as people at average risk.

## Testing for Lynch syndrome (hereditary non-polyposis colorectal cancer, or HNPCC)

Lynch syndrome can greatly increase a person's risk for colorectal cancer. The lifetime risk of colorectal cancer in people with this condition can range from about 10% to about 80%, depending on which gene mutation is causing the syndrome.

People with Lynch syndrome are also at increased risk for some other cancers, such as cancers of the uterus (endometrium), ovaries, stomach, small bowel, pancreas, kidneys, brain, ureters (tubes that carry urine from the kidneys to the bladder), and bile duct.

### Who should be tested for Lynch syndrome?

There are two sets of guidelines that doctors often use to determine who might be likely to benefit from genetic counseling or testing: the Amsterdam criteria (based on family history) and the revised Bethesda guidelines (for people diagnosed with colorectal cancer).

#### ***Amsterdam criteria***

Doctors have found that many families with Lynch syndrome tend to have certain characteristics, which are known as the *Amsterdam criteria*:

- At least 3 relatives have a cancer linked with Lynch syndrome.
- One is a first-degree relative (parent, brother or sister, or child) of the other 2 relatives.
- At least 2 successive generations are affected.
- At least 1 relative had their cancer when they were younger than age 50.

If all of these apply to your family, then you might want to seek genetic counseling. But even if your family history satisfies the Amsterdam criteria, it doesn't always mean you have Lynch syndrome. And many families with Lynch syndrome do not meet the Amsterdam criteria.

#### ***Revised Bethesda guidelines***

A second set of criteria, called the *revised Bethesda guidelines*, can be used to help decide whether a person with colorectal cancer should be tested for genetic changes that are seen with Lynch syndrome. (These changes are called *microsatellite instability* or *MSI*.) These criteria include at least one of the following:



- The person is younger than 50 years when diagnosed with colorectal cancer.
- The person has or had a second colorectal cancer or another cancer ([endometrial](#)<sup>3</sup>, [stomach](#)<sup>4</sup>, [pancreas](#)<sup>5</sup>, [small intestine](#)<sup>6</sup>, [ovary](#)<sup>7</sup>, [kidney](#)<sup>8</sup>, [brain](#)<sup>9</sup>, ureters, or [bile duct](#)<sup>10</sup>) linked to Lynch syndrome.
- The person is younger than 60 years, and the cancer has certain characteristics seen with Lynch syndrome when it's viewed under a microscope.
- The person has a first-degree relative (parent, sibling, or child) younger than 50 who was diagnosed with colorectal cancer or another cancer linked to Lynch syndrome .
- The person has 2 or more first- or second-degree relatives (aunts, uncles, nieces, nephews, or grandparents) who had colorectal cancer or another Lynch syndrome-related cancer at any age.

If a person with colorectal cancer has any of the Bethesda criteria, testing for MSI may be advised. If MSI is found, the doctor typically will recommend that the patient be tested for Lynch syndrome-associated gene mutations.

It's important to know that most people who meet the Bethesda criteria do not have Lynch syndrome, and that you can have Lynch syndrome and not meet any of the criteria listed. Not all doctors use the Bethesda guidelines to decide who should have MSI testing. In fact, some experts recommend that all colorectal cancers be tested for MSI. Most doctors recommend genetic testing for Lynch syndrome for anyone whose cancer tests positive for MSI.

Even if you don't have cancer, your doctor may suspect that Lynch syndrome runs in your family based on cases of colorectal cancer and other cancers associated with this syndrome in your relatives. In that case, your doctor might recommend genetic counseling to evaluate your risk.

### **If your family carries Lynch syndrome**

In families known to carry a Lynch syndrome gene mutation, doctors recommend that family members who have tested positive for the mutation and those who have not been tested should start colonoscopy screening during their early 20s, or 2 to 5 years younger than the youngest person in the family with a diagnosis (whichever is earlier). Testing should be done every 1 or 2 years. This way polyps can be found and removed and any cancers can be found at the earliest possible stage. (See the section [American Cancer Society Recommendations for Colorectal Cancer Early Detection](#)<sup>11</sup>.) People known to carry one of the gene mutations may also be given the choice of having surgery to remove most of the colon.



## Testing for familial adenomatous polyposis (FAP)

Familial adenomatous polyposis (FAP) typically causes hundreds of polyps in the colon and rectum, which over time leads to colorectal cancer. Because FAP causes polyps and cancer earlier than the usual age colorectal cancer screening is started, it sometimes isn't diagnosed until someone already has cancer.

Genetic counseling and testing is available for people who may have FAP based on their personal or family history. If changes in the gene that causes FAP are found in one person, doctors will recommend that his or her close relatives (brothers, sisters, and children) be tested. FAP may also be suspected if a person is found to have many polyps during a colonoscopy that was done because of problems like rectal bleeding or anemia.

People who test positive for the gene change linked to FAP should start being screened with colonoscopy in their teens. (See [American Cancer Society Recommendations for Colorectal Cancer Early Detection](#)<sup>12</sup>.) For people with FAP, the lifetime risk of developing colorectal cancer is near 100%, and in most cases it develops before the age of 50. Many doctors recommend that people with FAP have their colon removed when they're in their 20s to prevent cancer from developing.

## Testing for other inherited cancer syndromes

Certain other inherited syndromes, such as MYH- or MUTYH-associated polyposis and Peutz-Jeghers syndrome, can also greatly increase a person's risk of colorectal cancer. If you have certain criteria that suggest you might have one of the syndromes, your doctor might recommend genetic counseling and testing to look for the gene changes that cause them.

## Hyperlinks

1. [www.cancer.org/cancer/cancer-causes/genetics/understanding-genetic-testing-for-cancer.html](http://www.cancer.org/cancer/cancer-causes/genetics/understanding-genetic-testing-for-cancer.html)
2. [www.cancer.org/cancer/cancer-causes/genetics/what-happens-during-genetic-testing-for-cancer.html](http://www.cancer.org/cancer/cancer-causes/genetics/what-happens-during-genetic-testing-for-cancer.html)
3. [www.cancer.org/cancer/endometrial-cancer.html](http://www.cancer.org/cancer/endometrial-cancer.html)
4. [www.cancer.org/cancer/stomach-cancer.html](http://www.cancer.org/cancer/stomach-cancer.html)
5. [www.cancer.org/cancer/pancreatic-cancer.html](http://www.cancer.org/cancer/pancreatic-cancer.html)
6. [www.cancer.org/cancer/small-intestine-cancer.html](http://www.cancer.org/cancer/small-intestine-cancer.html)
7. [www.cancer.org/cancer/ovarian-cancer.html](http://www.cancer.org/cancer/ovarian-cancer.html)

8. [www.cancer.org/cancer/kidney-cancer.html](http://www.cancer.org/cancer/kidney-cancer.html)
9. [www.cancer.org/cancer/brain-spinal-cord-tumors-adults.html](http://www.cancer.org/cancer/brain-spinal-cord-tumors-adults.html)
10. [www.cancer.org/cancer/bile-duct-cancer.html](http://www.cancer.org/cancer/bile-duct-cancer.html)
11. [/content/cancer/en/cancer/colon-rectal-cancer/early-detection/acs-recommendations.html](http://content.cancer/en/cancer/colon-rectal-cancer/early-detection/acs-recommendations.html)
12. [/content/cancer/en/cancer/colon-rectal-cancer/early-detection/acs-recommendations.html](http://content.cancer/en/cancer/colon-rectal-cancer/early-detection/acs-recommendations.html)

## References

National Comprehensive Cancer Network, Clinical Practice Guidelines in Oncology (NCCN Guidelines®), Genetic/Familial High-Risk Assessment: Colorectal, Version 3.2017 -- October 10, 2017. Accessed at [https://www.nccn.org/professionals/physician\\_gls/pdf/genetics\\_colon.pdf](https://www.nccn.org/professionals/physician_gls/pdf/genetics_colon.pdf) on February 5, 2018.

Last Medical Review: February 21, 2018 Last Revised: February 21, 2018

## Written by

The American Cancer Society medical and editorial content team  
([www.cancer.org/cancer/acs-medical-content-and-news-staff.html](http://www.cancer.org/cancer/acs-medical-content-and-news-staff.html))

Our team is made up of doctors and oncology certified nurses with deep knowledge of cancer care as well as journalists, editors, and translators with extensive experience in medical writing.

American Cancer Society medical information is copyrighted material. For reprint requests, please see our Content Usage Policy ([www.cancer.org/about-us/policies/content-usage.html](http://www.cancer.org/about-us/policies/content-usage.html)).

**cancer.org | 1.800.227.2345**



[cancer.org](https://www.cancer.org) | 1.800.227.2345

# Colorectal Cancer Early Detection, Diagnosis, and Staging

## Detection and Diagnosis

Finding cancer early, when it's small and hasn't spread, often allows for more treatment options. Some early cancers may have signs and symptoms that can be noticed, but that's not always the case.

- [Can Colorectal Polyps and Cancer Be Found Early?](#)
- [American Cancer Society Guideline for Colorectal Cancer Screening](#)
- [Colorectal Cancer Screening Tests](#)
- [Insurance Coverage for Colorectal Cancer Screening](#)
- [Colorectal Cancer Signs and Symptoms](#)
- [Tests to Diagnose and Stage Colorectal Cancer](#)
- [Understanding Your Pathology Report<sup>1</sup>](#)

## Stages and Outlook (Prognosis)

After a cancer diagnosis, staging provides important information about the extent of cancer in the body and anticipated response to treatment.

- [Colorectal Cancer Stages](#)
- [Survival Rates for Colorectal Cancer](#)

## Questions to Ask About Colorectal Cancer

Here are some questions you can ask your cancer care team to help you better understand your cancer diagnosis and treatment options.

- [Questions to Ask Your Doctor About Colorectal Cancer](#)

## Can Colorectal Polyps and Cancer Be Found Early?

Screening is the process of looking for cancer or pre-cancer in people who have no symptoms of the disease. Regular colorectal cancer screening is one of the most powerful weapons against colorectal cancer.

**Screening can often find colorectal cancer early**, when it's small, hasn't spread, and might be easier to treat. **Regular screening can even prevent colorectal cancer.** A polyp can take as many as 10 to 15 years to develop into cancer. With screening, doctors can find and remove polyps before they have the chance to turn into cancer.

### Why is colorectal cancer screening important?

Colorectal cancer is a leading cause of cancer death for both men and women in the US . But the death rate (the number of deaths per 100,000 people per year) of colorectal cancer has been dropping for several decades. One reason for this is that colorectal polyps are now more often found by screening and removed before they can develop into cancers.

When colorectal cancer is found at an early stage before it has spread, the 5-year relative survival rate is about 90%. But only about 4 out of 10 colorectal cancers are found at this early stage. When cancer has spread outside the colon or rectum, survival rates are lower.

Unfortunately, about 1 in 3 people in the US who should get tested for colorectal cancer have never been screened. This may be because they don't know that regular testing could save their lives from this disease, or due to things like cost and health insurance coverage issues.

See [Colorectal Cancer Screening Tests](#) for more on the tests used to screen for colorectal cancer. [American Cancer Society Recommendations for Colorectal Cancer Early Detection](#) has our guidelines for using these tests to find colorectal cancer and

polyps.

## References

American Cancer Society. *Cancer Facts & Figures 2018*. Atlanta, American Cancer Society; 2018.

American Cancer Society. *Colorectal Cancer Facts & Figures 2017-2019*. Atlanta, American Cancer Society; 2017.

Last Medical Review: February 21, 2018 Last Revised: February 21, 2018

---

# American Cancer Society Guideline for Colorectal Cancer Screening

## For people at average risk

The ACS recommends that people at average risk\* of colorectal cancer **start regular screening at age 45**. This can be done either with a sensitive test that looks for signs of cancer in a person's stool (a stool-based test), or with an exam that looks at the colon and rectum (a visual exam). These options are listed below.

People who are in good health and with a life expectancy of more than 10 years should continue regular colorectal cancer screening through the **age of 75**.

For people **ages 76 through 85**, the decision to be screened should be based on a person's preferences, life expectancy, overall health, and prior screening history.

People **over 85** should no longer get colorectal cancer screening.

\*For screening, people are considered to be at average risk if they **do not** have:

- A personal history of colorectal cancer or certain types of polyps

- A family history of colorectal cancer
- A personal history of inflammatory bowel disease (ulcerative colitis or Crohn's disease)
- A confirmed or suspected hereditary colorectal cancer syndrome, such as familial adenomatous polyposis (FAP) or Lynch syndrome (hereditary non-polyposis colon cancer or HNPCC)
- A personal history of getting radiation to the abdomen (belly) or pelvic area to treat a prior cancer

## Test options for colorectal cancer screening

Several test options are available for colorectal cancer screening:

### Stool-based tests

- Highly sensitive fecal immunochemical test (FIT) every year
- Highly sensitive guaiac-based fecal occult blood test (gFOBT) every year
- Multi-targeted stool DNA test (MT-sDNA) every 3 years

### Visual (structural) exams of the colon and rectum

- Colonoscopy every 10 years
- CT colonography (virtual colonoscopy) every 5 years
- Flexible sigmoidoscopy (FSIG) every 5 years

There are some differences between these tests to consider (see [Colorectal Cancer Screening Tests](#)), but the most important thing is to get screened, no matter which test you choose. Talk to your health care provider about which tests might be good options for you, and to your [insurance provider about your coverage](#).

If a person chooses to be screened with a test other than colonoscopy, any abnormal test result should be followed up with colonoscopy.

## For people at increased or high risk

People at increased or high risk of colorectal cancer might need to start colorectal

cancer screening before age 45, be screened more often, and/or get specific tests. This includes people with:

- A strong family history of colorectal cancer or certain types of polyps (see [Colorectal Cancer Risk Factors<sup>1</sup>](#))
- A personal history of colorectal cancer or certain types of polyps
- A personal history of inflammatory bowel disease (ulcerative colitis or Crohn's disease)
- A known family history of a hereditary colorectal cancer syndrome such as familial adenomatous polyposis (FAP) or Lynch syndrome (also known as hereditary non-polyposis colon cancer or HNPCC)
- A personal history of radiation to the abdomen (belly) or pelvic area to treat a prior cancer

**The American Cancer Society does not have screening guidelines specifically for people at increased or high risk of colorectal cancer.** However, some other professional medical organizations, such as the US Multi-Society Task Force on Colorectal Cancer (USMSTF), do put out such guidelines. These guidelines are complex and are best looked at along with your health care provider. In general, these guidelines divide people into several groups (although the details depend on each person's specific risk factors).

## **People at increased risk for colorectal cancer**

### **People with one or more family members who have had colon or rectal cancer**

Screening recommendations for these people depend on who in the family had cancer and how old they were when it was diagnosed. Some people with a family history will be able to follow the recommendations for average risk adults, but others might need to get a colonoscopy (and not any other type of test) more often, and possibly starting before age 45.

### **People who have had certain types of polyps removed during a colonoscopy**

Most of these people will need to get a colonoscopy again after 3 years, but some people might need to get one earlier (or later) than 3 years, depending on the type, size, and number of polyps.

### **People who have had colon or rectal cancer**

Most of these people will need to start having colonoscopies regularly within a year of surgery to remove the cancer. Other procedures like ultrasound might also be recommended for some people with rectal cancer, depending on the type of surgery they had.

### **People who have had radiation to the abdomen (belly) or pelvic area to treat a prior cancer**

Most of these people will need to start having colonoscopies at an earlier age (depending on how old they were when they got the radiation), and might need to be screened more often than normal (such as at least every 5 years).

### **People at high risk for colorectal cancer**

#### **People with inflammatory bowel disease (Crohn's disease or ulcerative colitis)**

These people generally need to get colonoscopies (not any other type of test) every 1 to 2 years, starting at an earlier age.

#### **People known or suspected to have certain genetic syndromes**

These people generally need to have colonoscopy (not any of the other tests). Screening is often recommended to begin at a young age, possibly as early as the teenage years for some syndromes – and needs to be done much more frequently. Specifics depend on which genetic syndrome you have, and other factors.

If you're at increased or high risk of colorectal cancer (or think you might be), talk to your health care provider to learn more. Your provider can suggest the best screening option for you, as well as determine what type of screening schedule you should follow, based on your individual risk.

### **Hyperlinks**

1. [www.cancer.org/cancer/colon-rectal-cancer/causes-risks-prevention/risk-factors.html](http://www.cancer.org/cancer/colon-rectal-cancer/causes-risks-prevention/risk-factors.html)

### **References**

Children's Oncology Group. Long-Term Follow-Up Guidelines for Survivors of



Childhood, Adolescent, and Young Adult Cancer. Version 4.0 - October 2013. Accessed at [http://www.survivorshipguidelines.org/pdf/LTFUGuidelines\\_40.pdf](http://www.survivorshipguidelines.org/pdf/LTFUGuidelines_40.pdf) on May 14, 2018.

Smith RA, Andrews KS, Brooks D, Fedewa SA, Manassaram-Baptiste D, Saslow D, Brawley OW, Wender RC. Cancer screening in the United States, 2018: A review of current American Cancer Society guidelines and current issues in cancer screening. *CA: Cancer J Clin*. 2018 [Epub ahead of print].

Last Medical Review: February 21, 2018 Last Revised: May 30, 2018

---

## Colorectal Cancer Screening Tests

Screening is the process of looking for cancer in people who have no symptoms. Several tests can be used to screen for colorectal cancer (see [American Cancer Society Guideline for Colorectal Cancer Screening](#)). These tests can be divided into 2 main groups:

- **Stool-based tests:** These tests check the stool (feces) for signs of cancer. These tests are less invasive and easier to have done, but they need to be done more often.
- **Visual (structural) exams:** These tests look at the structure of the colon and rectum for any abnormal areas. This is done either with a scope (a tube-like instrument with a light and tiny video camera on the end) put into the rectum, or with special imaging (x-ray) tests.

These tests each have different pros and cons (see the table below), and some of them might be better options for you than others. But the most important thing is to get screened, no matter which test you choose.

If you choose to be screened with a test other than colonoscopy, any abnormal test result should be followed up with colonoscopy.

These tests, as well as others, can also be used when people have [symptoms of colorectal cancer](#) or other digestive diseases such as inflammatory bowel disease.

## Stool-based tests

These tests look at the stool (feces) for possible signs of colorectal cancer (or polyps). Many people find these tests easier to have than tests like colonoscopy, and they are typically done at home. But these tests need to be done more often. And if the result from one of these stool tests is positive (abnormal), you'll still need a colonoscopy to see if you have cancer.

### Fecal immunochemical test (FIT)

One way to test for colorectal cancer is to look for occult (hidden) blood in stool. The idea behind this type of test is that blood vessels in larger colorectal polyps or cancers are often fragile and easily damaged by the passage of stool. The damaged vessels usually bleed into the colon or rectum, but only rarely is there enough bleeding for blood to be seen in the stool.

The fecal immunochemical test (FIT) is also called an *immunochemical fecal occult blood test* (iFOBT). It tests for hidden blood in the stool. This test reacts to part of the human hemoglobin protein, which is found in red blood cells.

For this test, small amounts of stool are collected on cards (or in tubes). You can do this in the privacy of your own home. Unlike the gFOBT (see below), there are no drug or dietary restrictions before the test (as vitamins and foods do not affect the FIT), and collecting the samples may be easier. This test is also less likely to react to bleeding from other parts of the digestive tract, such as the stomach.

This test must be done every year, unlike some other tests (like the visual tests described below).

If the test results are positive (that is, if hidden blood is detected), a colonoscopy will be needed to investigate further. Although blood in the stool can be from cancers or polyps, it can also have other causes, such as ulcers, hemorrhoids, or other conditions.

**Collecting the samples:** Your health care provider will give you the supplies you need for testing. Have all of your supplies ready and in one place. Supplies typically include a test kit, test cards or tubes, long brushes or other collecting devices, waste bags, and a mailing envelope. The kit will give you detailed instructions on how to collect the samples. **Be sure to follow the instructions that come with your kit, as different kits might have different instructions.** If you have any questions about how to use your kit, contact your health care provider's office or clinic. Once you have collected the samples, return them as instructed in the kit.

## Guaiaic-based fecal occult blood test (gFOBT)

The guaiac-based fecal occult blood test (gFOBT) detects occult (hidden) blood in the stool through a chemical reaction, in a different way than a FIT. But like the FIT, this test can't tell if the blood is from the colon or from other parts of the digestive tract (such as the stomach).

The American Cancer Society recommends the more modern, highly sensitive versions of this test for screening.

This test must be done every year, unlike some other tests (like the visual tests described below).

This test is done with a kit that you can use in the privacy of your own home that allows you to check more than one stool sample. *A FOBT done during a digital rectal exam in the doctor's office (which only checks one stool sample) is not enough for proper screening, as it is likely to miss most colorectal cancers.*

If the test results are positive (that is, if hidden blood is detected), a colonoscopy will be needed to find the reason for the bleeding. It's not enough to simply repeat this test or follow up with tests other than a colonoscopy.

**Before the test:** Some foods or drugs can affect the results of this test, so you may be instructed to avoid the following before this test:

- Non-steroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen (Advil), naproxen (Aleve), or aspirin, for 7 days before testing. (They can cause bleeding, which can lead to a false-positive result.) **Note:** People should try to avoid taking NSAIDs for minor aches prior to the test. But if you take these medicines daily for heart problems or other conditions, don't stop them for this test without talking to your health care provider first.
- Vitamin C in excess of 250 mg daily from either supplements or citrus fruits and juices for 3 days before testing. (This can affect the chemicals in the test and make the result negative, even if blood is present.)
- Red meats (beef, lamb, or liver) for 3 days before testing. (Components of blood in the meat may cause a positive test result.)

Some people who are given the test never do it or don't return it because they worry that something they ate may affect the test. Even if you are concerned that something you ate may alter the test, the most important thing is to get the test done.

**Collecting the samples:** People having this test will get a kit with instructions from their health care provider's office or clinic. The kit will explain how to take stool samples at home (usually samples from 3 straight bowel movements are smeared onto small squares of paper). The kit is then returned to the doctor's office or medical lab (usually within 2 weeks) for testing.

When doing this test, have all of your supplies ready and in one place. Supplies typically include a test kit, test cards, either a brush or wooden applicator, and a mailing envelope. The kit will give you detailed instructions on how to collect the stool samples. **Be sure to follow the instructions that come with your kit, as different kits might have different instructions.** If you have any questions about how to use your kit, contact your health care provider's office or clinic. Once you have collected the samples, return them as instructed in the kit.

### Stool DNA test

A stool DNA test (also known as a multitargeted stool DNA test, or MT-sDNA) looks for certain abnormal sections of DNA from cancer or polyp cells. Colorectal cancer or polyp cells often have DNA mutations (changes) in certain genes. Cells with these mutations often get into the stool, where tests may be able to detect them. Cologuard<sup>®</sup>, the only test currently available, tests for both DNA changes and blood in the stool.

**Collecting the samples:** You'll get a kit in the mail to use to collect your entire stool sample at home. The kit will have a sample container, a bracket for holding the container in the toilet, a bottle of liquid preservative, a tube, labels, and a shipping box. The kit has detailed instructions on how to collect the sample. **Be sure to follow the instructions that come with your kit.** If you have any questions about how to use your kit, contact your doctor's office or clinic. Once you have collected the sample, return it as instructed in the kit.

This test should be done every 3 years. If the test is positive (if it finds DNA changes or blood), a colonoscopy will be needed.

### Visual (structural) exams

These tests look at the structure of the inside of the colon and rectum for any abnormal areas that might be cancer or polyps. These tests can be done less often than stool-based tests, but they require more preparation ahead of time, and can have some risks not seen with stool-based tests.

### Colonoscopy

For this test, the doctor looks at the entire length of the colon and rectum with a colonoscope, a flexible tube about the width of a finger with a light and small video camera on the end. It's put in through the anus and into the rectum and colon. Special instruments can be passed through the colonoscope to biopsy (sample) or remove any suspicious-looking areas such as polyps, if needed.

**Before the test:** Be sure your doctor knows about any medicines you are taking (including daily aspirin, vitamins, or supplements). You might need to change how you take them before the test.

The colon and rectum must be empty and clean so your doctor can see the entire inner lining during the test. There are different ways to do this, including pills, fluids, and enemas (or combinations of these). For example, you might need to drink large amounts of a liquid laxative solution the evening before the procedure. This often results in spending a lot of time in the bathroom. Because the process of cleaning out the colon and rectum is sometimes unpleasant, it can keep some people from getting this test done. However, newer kits are available to clean out the bowel and may be better tolerated than previous ones. Your health care provider can discuss the options with you.

Your health care provider will give you specific instructions. It's important to read them carefully a few days ahead of time, since you may need to follow a special diet for at least a day before the test and to shop for supplies and laxatives. If you're not sure about any of the instructions, call the health care provider's office and get your questions answered.

You will probably also be told not to eat or drink anything after a certain hour the night before your test. If you normally take prescription medicines in the mornings, talk with your doctor or nurse about how to manage them for that day.

Because a sedative is used to help keep you more comfortable during the test, you will most likely need to arrange for someone you know to take you home after the test. You might need someone to help you get into your home if you are sleepy or dizzy, so many centers that do colonoscopies will not discharge people to go home in a cab or a ridesharing service. If transportation might be a problem, talk with your health care provider about the policy at your hospital or surgery center for using one of these services. There may be other resources available for getting home, depending on the situation.

**During the test:** The test itself usually takes about 30 minutes, but it may take longer if one or more polyps is found and removed. Before the test starts, you'll likely be given a sedative (into a vein) to make you feel relaxed and sleepy during the procedure. For

most people, this medicine makes them unable to remember the procedure afterward. You'll wake up after the test is over, but you might not be fully awake until later in the day.

During the test, you'll be asked to lie on your side with your knees pulled up. A drape will cover you. Your blood pressure, heart rate, and breathing rate will be monitored during and after the test.

Your doctor might insert a gloved finger into the rectum to examine it before putting in the colonoscope. The colonoscope is lubricated so it can be inserted easily into the rectum. Once in the rectum, the colonoscope is passed all the way to the beginning of the colon, called the cecum.

If you're awake, you may feel an urge to have a bowel movement when the colonoscope is inserted or pushed further up the colon. The doctor also puts air into the colon through the colonoscope to make it easier to see the lining of the colon and use the instruments to perform the test. To ease any discomfort, it may help to breathe deeply and slowly through your mouth.

The doctor will look at the inner walls of the colon as he or she slowly removes the colonoscope. If a small polyp is found, it may be removed and then sent to a lab to check if it has any areas that have changed into cancer. This is because some small polyps may become cancer over time.

If your doctor sees a larger polyp or tumor, or anything else abnormal, a small piece of it will be removed (biopsied) through the colonoscope. It will be checked in the lab to see if it's cancer, a benign (non-cancerous) growth, or something else.

**Possible side effects and complications:** The bowel preparation before the test can be unpleasant.

The test itself might be uncomfortable, but the sedative usually helps with this, and most people feel back to normal once the effects of the sedative wear off. Because air is pumped into the colon and rectum during the test, people sometimes feel bloated, have gas pains, or have cramping for a while after the test until the air passes out.

Some people may have low blood pressure or changes in heart rhythm from the sedation during the test, but these are rarely serious.

If a polyp is removed or a biopsy is done during the colonoscopy, you might notice some blood in your stool for a day or 2 after the test. Serious bleeding is uncommon, but in rare cases, bleeding might need to be treated or can even be life-threatening.

Colonoscopy is a safe procedure, but in rare cases the colonoscope can puncture the wall of the colon or rectum. This is called a *perforation*. Symptoms can include severe abdominal (belly) pain, nausea, and vomiting. This can be a major (or even life-threatening) complication, because it can lead to a serious abdominal (belly) infection. The hole may need to be repaired with surgery. Ask your doctor about the risk of this complication.

### **CT colonography (virtual colonoscopy)**

This test is an advanced type of computed tomography (CT) scan of the colon and rectum. A CT scan uses x-rays, but instead of taking one picture, like a regular x-ray, a CT scanner takes many pictures as it rotates around you while you lie on a table. A computer then combines these pictures into detailed images of the part of your body being studied.

For CT colonography, special computer programs create both 2-dimensional x-ray pictures and a 3-dimensional view of the inside of the colon and rectum, which lets the doctor look for polyps or cancer.

This test may be especially useful for some people who can't have or don't want to have a more invasive test such as a colonoscopy. It can be done fairly quickly, and sedation isn't needed.

But although this test is not invasive like a colonoscopy, the same type of bowel prep is needed. A small, flexible tube is also put in the rectum for this test to fill the colon and rectum with air. And if polyps or other suspicious areas are seen on this test, a colonoscopy will still be needed to remove them or to explore them fully.

**Before the test:** It's important that the colon and rectum are emptied before this test to get the best images. You'll probably be told to follow a clear liquid diet for at least a day before the test. There are a number of ways to clean out the colon and rectum before the test. Often, the evening before the procedure, you drink large amounts of a liquid laxative solution. This often results in spending a lot of time in the bathroom. The morning of the test, sometimes more laxatives or enemas may be needed to make sure the bowels are empty. Newer kits are available to clean out the bowel and may be better tolerated than previous ones. Your doctor can discuss the options with you.

**During the test:** This test is done in a special room with a CT scanner. It takes about 10 minutes. You may be asked to drink a contrast solution before the test to help "tag" any stool left in the colon or rectum, which helps the doctor when looking at the test images. You'll be asked to lie on a narrow table that's part of the CT scanner, and will have a small, flexible tube put into your rectum. Air is pumped through the tube into the



colon and rectum to expand them to provide better images. The table then slides into the CT scanner, and you'll be asked to hold your breath for about 15 seconds while the scan is done. You'll likely have 2 scans: one while you're lying on your back and one while you're on your stomach or side.

**Possible side effects and complications:** There are usually few side effects after this test than after colonoscopy. You may feel bloated or have cramps because of the air in the colon and rectum, but this should go away once the air passes from the body. There's a very small risk that inflating the colon with air could injure or puncture it, but this risk is thought to be much less than with colonoscopy. Like other types of CT scans, this test also exposes you to a small amount of radiation.

### Flexible sigmoidoscopy

During this test, the doctor looks at part of the colon and rectum with a sigmoidoscope (a flexible, lighted tube about the thickness of a finger with a small video camera on the end). It's put in through the anus and into the rectum and moved into the lower part of the colon. Images from the scope are seen on a video screen.

Using the sigmoidoscope, your doctor can look at the inside of the rectum and part of the colon to detect (and possibly remove) any abnormalities. The sigmoidoscope is only about 60 centimeters (about 2 feet) long, so the doctor can see the entire rectum but less than half of the colon with this procedure.

This test is not widely used as a screening test for colorectal cancer in the United States.

**Before the test:** Be sure your doctor knows about any medicines you take. You might need to change how you take them before the test.

Your insides must be empty and clean so your doctor can see the lining of the sigmoid colon and rectum. You will get specific instructions to follow to clean them out. You may be asked to follow a special diet (such as drinking only clear liquids) or to use enemas or strong laxatives the day before the test to clean out your colon and rectum.

**During the test:** A sigmoidoscopy usually takes about 10 to 20 minutes. Most people don't need to be sedated for this test, but this might be an option you can discuss with your doctor. Sedation may make the test less uncomfortable, but you'll need some time to recover from it and you'll need someone with you to take you home after the test.

You'll probably be asked to lie on a table on your left side with your knees pulled up near your chest. Before the test, your doctor may put a gloved, lubricated finger into



your rectum to examine it. For the test itself, the sigmoidoscope is first lubricated to make it easier to insert into the rectum. The scope may feel cold as it's put in. Air will be pumped into the colon and rectum through the sigmoidoscope so the doctor can see the inner lining better.

If you are not sedated during the procedure, you might feel pressure and slight cramping in your lower belly. To ease discomfort and the urge to have a bowel movement, it may help to breathe deeply and slowly through your mouth. You'll feel better after the test once the air leaves your colon.

If any polyps are found during the test, the doctor may remove them with a small instrument passed through the scope. The polyps will be looked at in the lab. If a pre-cancerous polyp (an adenoma) or colorectal cancer is found, you'll need to have a colonoscopy later to look for polyps or cancer in the rest of the colon.

**Possible complications and side effects:** This test may be uncomfortable because of the air put into the colon and rectum, but it should not be painful. Be sure to let your doctor know if you feel pain during the procedure. You might see a small amount of blood in your bowel movements for a day or 2 after the test. More serious bleeding and puncture of the colon or rectum are possible complications, but they are very uncommon.

### What are some of the pros and cons of these screening tests?

Test	Pros	Cons
Fecal immunochemical test (FIT)	<ul style="list-style-type: none"> <li>No direct risk to the colon</li> <li>No bowel prep</li> <li>No pre-test diet or medication changes needed</li> <li>Sampling done at home</li> <li>Fairly inexpensive</li> </ul>	<ul style="list-style-type: none"> <li>Can miss many polyps and some cancers</li> <li>Can have false-positive test results</li> <li>Needs to be done every year</li> <li>Colonoscopy will be needed if abnormal</li> </ul>
Guaiac-based fecal occult blood test (gFOBT)	<ul style="list-style-type: none"> <li>No direct risk to the colon</li> </ul>	<ul style="list-style-type: none"> <li>Can miss many polyps and some cancers</li> </ul>

	<p>No bowel prep</p> <p>Sampling done at home</p> <p>Inexpensive</p>	<p>Can have false-positive test results</p> <p>Pre-test diet changes (and possibly medication changes) are needed</p> <p>Needs to be done every year</p> <p>Colonoscopy will be needed if abnormal</p>
Stool DNA test	<p>No direct risk to the colon</p> <p>No bowel prep</p> <p>No pre-test diet or medication changes needed</p> <p>Sampling done at home</p>	<p>Can miss many polyps and some cancers</p> <p>Can have false-positive test results</p> <p>Should be done every 3 years</p> <p>Colonoscopy will be needed if abnormal</p> <p>Still fairly new – may be insurance coverage issues</p>
Colonoscopy	<p>Can usually look at the entire colon</p> <p>Can biopsy and remove polyps</p> <p>Done every 10 years</p> <p>Can help find some other diseases</p>	<p>Can miss small polyps</p> <p>Full bowel prep needed</p> <p>Costs more on a one-time basis than other forms of testing</p> <p>Sedation is usually needed, in which case you will need someone to drive you home</p> <p>You may miss a day of work</p> <p>Small risk of bleeding, bowel tears, or infection</p>
CT colonography (virtual colonoscopy)	<p>Fairly quick and safe</p> <p>Can usually see the entire colon</p> <p>Done every 5 years</p>	<p>Can miss small polyps</p> <p>Full bowel prep needed</p> <p>Some false-positive test results</p> <p>Exposure to a small amount of</p>

	No sedation needed	radiation Can't remove polyps during testing Colonoscopy will be needed if abnormal Still fairly new – may be insurance coverage issues
Flexible sigmoidoscopy	Fairly quick and safe Usually doesn't require full bowel prep Sedation usually not used Does not require a specialist Done every 5 years	Not widely used as a screening test Looks at only about a third of the colon Can miss small polyps Can't remove all polyps May be some discomfort Very small risk of bleeding, infection, or bowel tear Colonoscopy will be needed if abnormal

Last Medical Review: January 27, 2017 Last Revised: May 30, 2018

## Insurance Coverage for Colorectal Cancer Screening

The American Cancer Society believes that all people should have access to cancer screenings, without regard to health insurance coverage. Limitations on coverage should not keep someone from the benefits of early detection of cancer. The Society supports policies that give all people access to and coverage of early detection tests for cancer. Such policies should be age- and risk-appropriate and based on current

scientific evidence as outlined in the [American Cancer Society's Early Detection Guidelines](#)<sup>1</sup>.

## Federal law

The [Affordable Care Act](#)<sup>2</sup> (ACA) requires both private insurers and Medicare to cover the costs of colorectal cancer screening tests, because these tests are recommended by the United States Preventive Services Task Force (USPSTF). The law stipulates that there should be no out-of-pocket costs for patients, such as co-pays or deductibles, for these screening tests. But the definition of a "screening" test can sometimes be confusing, as discussed below.

It's important to note that the USPSTF currently recommends that people at average risk starting screening at age 50, whereas [the American Cancer Society now recommends starting at age 45](#). There's nothing to stop insurers from covering the tests starting at age 45, and some are likely to do so, but **at this time insurers are not required to (and some might not) cover the cost of colorectal cancer screening before age 50**.

The ACA doesn't apply to health plans that were in place before it was passed in 2010, which are called "grandfathered plans." You can find out if your insurance plan is "grandfathered" by contacting your health insurance company or your employer's human resources department. Even if you have a "grandfathered plan," it may still have coverage requirements from state laws, which vary, and other federal laws.

## Private health insurance coverage for colorectal cancer screening

The Affordable Care Act requires health plans that started on or after September 23, 2010 to cover [colorectal cancer screening tests](#), which includes a range of test options. In most cases there should be no out-of-pocket costs for these tests, such as co-pays or deductibles.

### For people who choose to be screened with colonoscopy

Many people choose to be screened with colonoscopy. While it might not be right for everyone, it can have some advantages, such as only needing to be done once every 10 years. And if the doctor sees something abnormal during the colonoscopy, it can be biopsied or removed at that time, most likely without needing any other test.

Although many private insurance plans cover the costs for colonoscopy as a screening

test, you still might be charged for some services. Review your health insurance plan for specific details, including if your doctor is on your insurance company's list of "in-network" providers. If the doctor is not in the plan's network, you may have to pay more out-of-pocket. **Call your insurer if there's anything you're not sure about.**

Soon after the ACA became law, some insurance companies considered a colonoscopy to no longer be just a 'screening' test if a polyp was removed during the procedure. It would then be a 'diagnostic' test, and would therefore be subject to co-pays and deductibles. However, the US Department of Health and Human Services has clarified that removal of a polyp is an integral part of a screening colonoscopy, and therefore patients with private insurance should not have to pay out-of-pocket for it (although this does not apply to Medicare, as discussed below).

**Before you get a screening colonoscopy, ask your insurance company how much (if anything) you should expect to pay for it.** Find out if this amount could change based on what's found during the test. This can help you avoid surprise costs. If you do have large bills afterward, you may be able to appeal the insurance company's decision.

### **For people who choose to be screened with a different test**

Test options other than colonoscopy are also available, and people might choose one of these other tests for a variety of reasons. Again, the screening test itself should be covered, with no out-of-pocket costs such as co-pays or deductibles. But if you have a screening test other than colonoscopy and the result is positive (abnormal), you will need to have a colonoscopy. Some insurers consider this to be a **diagnostic** (not screening) colonoscopy, so you may have to pay the usual deductible and co-pay.

**Before you get a screening test, check with your insurance provider about what it might mean if you need a colonoscopy as a result of the test, and how much (if anything) you should expect to pay for it.** This can help you avoid surprise costs. If you do have large bills afterward, you may be able to appeal the insurance company's decision.

### **Medicare coverage for colorectal cancer screening**

[Medicare](#)<sup>3</sup> covers an initial preventive physical exam for all new Medicare beneficiaries. It must be done within one year of enrolling in Medicare. The "Welcome to Medicare" physical includes referrals for preventive services already covered under Medicare, including colon cancer screening tests.

If you've had Medicare Part B for longer than 12 months, a yearly "wellness" visit is covered without any cost. This visit is used to develop or update a personalized prevention plan to prevent disease and disability. Your provider should discuss a screening schedule (like a checklist) with you for preventive services you should have, including colon cancer screening.

### **What colorectal cancer screening tests does Medicare cover?**

Medicare covers the following tests, generally starting at age 50:

**Fecal occult blood test (FOBT) or fecal immunochemical test (FIT)** once every 12 months.

**Stool DNA test** (Cologuard) every 3 years for people 50 to 85 years old who do not have symptoms of colorectal cancer and who do not have an increased risk of colorectal cancer.

**Flexible sigmoidoscopy** every 4 years, but not within 10 years of a previous colonoscopy.

### **Colonoscopy**

- Once every 2 years for those at high risk (regardless of age)
- Once every 10 years for those who are at average risk
- 4 years after a flexible sigmoidoscopy for those who are at average risk

**Double-contrast barium enema** if a doctor determines that its screening value is equal to or better than flexible sigmoidoscopy or colonoscopy:

- Once every 2 years for those who are at high risk
- Once every 4 years for those who are at average risk

At this time, Medicare does not cover the cost of **virtual colonoscopy** (CT colonography).

**If you have questions about your costs, including deductibles or co-pays, it's best to speak with your insurer.**

**What would someone on Medicare expect to pay for a colorectal cancer screening test?**

- **FOBT/FIT:** Covered at no cost\* (no co-insurance or Part B deductible).
- **Stool DNA test (Cologuard):** Covered at no cost\* for those age 50 to 85 as long as they are not at increased risk of colorectal cancer and don't have symptoms of colorectal cancer (no co-insurance or Part B deductible).
- **Flexible sigmoidoscopy:** Covered at no cost\* (no co-insurance, co-payment, or Part B deductible) when the test is done for screening. **Note:** If the test results in the biopsy or removal of a growth, it's no longer a "screening" test, and you will be charged the 20% co-insurance and/or a co-pay (but you don't have to pay the Part B deductible).
- **Colonoscopy:** Covered at no cost\* at any age (no co-insurance, co-payment, or Part B deductible) when the test is done for screening. **Note:** If the test results in the biopsy or removal of a growth, it's no longer a "screening" test, and you will be charged the 20% co-insurance and/or a co-pay (but you don't have to pay the deductible).
- **Double-contrast barium enema:** You pay 20% of the Medicare approved amount for the doctor services. If the test is done in an outpatient hospital department or ambulatory surgical center, you also pay the hospital co-payment.

**If you're getting a screening colonoscopy (or sigmoidoscopy), be sure to find out how much you might have to pay for it.** Also ask how much you will have to pay if a polyp is removed or a biopsy is done. This can help you avoid surprise costs. You may still have to pay for the bowel prep kit, anesthesia or sedation, pathology costs, and facility fee. You may get one or more bills for different parts of the procedure from different practices and hospital providers.

It's important to understand that if you have a screening test other than colonoscopy and the result is positive (abnormal), you will need to have a colonoscopy. This is typically considered a **diagnostic** (not screening) colonoscopy, so you may have to pay the usual deductible and co-pay.

*\*This service is covered at no cost as long as the doctor accepts assignment (the amount Medicare pays as the full payment). Doctors that do not accept assignment are required to tell you up front.*

## **Medicaid coverage for colorectal cancer screening**

States are authorized to cover colorectal screening under their Medicaid programs. But unlike Medicare, there's no federal assurance that all state Medicaid programs must cover colorectal cancer screening in people without symptoms. Medicaid coverage for colorectal cancer screening varies by state. Some states cover fecal occult blood testing

(FOBT), while others cover colorectal cancer screening if a doctor determines the test is medically necessary. In some states, coverage varies according to which Medicaid managed care plan a person is enrolled in.

## Hyperlinks

1. [www.cancer.org/healthy/find-cancer-early/cancer-screening-guidelines.html](http://www.cancer.org/healthy/find-cancer-early/cancer-screening-guidelines.html)
2. [www.cancer.org/treatment/finding-and-paying-for-treatment/understanding-health-insurance/health-insurance-laws/the-health-care-law.html](http://www.cancer.org/treatment/finding-and-paying-for-treatment/understanding-health-insurance/health-insurance-laws/the-health-care-law.html)
3. [www.cancer.org/healthy/find-cancer-early/cancer-screening-guidelines/medicare-coverage-for-cancer-prevention-and-early-detection.html](http://www.cancer.org/healthy/find-cancer-early/cancer-screening-guidelines/medicare-coverage-for-cancer-prevention-and-early-detection.html)

## References

US Department of Health and Human Services. Your Medicare Coverage: Colorectal Cancer Screenings. Accessed at [www.medicare.gov/coverage/colorectal-cancer-screenings.html](http://www.medicare.gov/coverage/colorectal-cancer-screenings.html) on May 15, 2018.

Wolf AM, Fontham ET, Church TR, et al. Colorectal cancer screening for average risk adults: 2018 guideline update from the American Cancer Society. *CA: Cancer J Clin*. 2018 [Epub ahead of print].

Last Medical Review: February 21, 2018 Last Revised: May 30, 2018

---

# Colorectal Cancer Signs and Symptoms

Colorectal cancer might not cause symptoms right away, but if it does, it may cause one or more of these symptoms:

- A change in bowel habits, such as diarrhea, constipation, or narrowing of the stool, that lasts for more than a few days
- A feeling that you need to have a bowel movement that's not relieved by having one
- Rectal bleeding with bright red blood
- Blood in the stool, which may make the stool look dark



- Cramping or abdominal (belly) pain
- Weakness and fatigue
- Unintended weight loss

Colorectal cancers can often bleed into the digestive tract. Sometimes the blood can be seen in the stool or make it look darker, but often the stool looks normal. But over time, the blood loss can build up and can lead to low red blood cell counts (anemia). Sometimes the first sign of colorectal cancer is a blood test showing a low red blood cell count.

Many of these symptoms can be caused by conditions other than colorectal cancer, such as infection, hemorrhoids, or irritable bowel syndrome. Still, if you have any of these problems, it's important to see your doctor right away so the cause can be found and treated, if needed. See [Tests to Diagnose Colorectal Cancer](#).

## References

American Cancer Society. *Colorectal Cancer Facts & Figures 2017-2019*. Atlanta, Ga: American Cancer Society; 2017.

Libutti SK, Salz LB, Willett CG, Levine RA. Chapter 57: Cancer of the colon. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

Libutti SK, Willett CG, Salz LB, Levine RA. Chapter 60: Cancer of the rectum. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

Sigurdson ER, Benson AB, Minsky B. Cancer of the rectum. In: Niederhuber JE, Armitage JO, Dorshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5th ed. Philadelphia, Pa. Elsevier: 2014: 1336-1359.

Steele SR, Johnson EK, Champagne B et al. Endoscopy and polyps-diagnostic and therapeutic advances in management. *World J Gastroenterol* 2013; 19(27): 4277-4288.

Van Schaeybroeck S, Lawler M, Johnston B, et al. Colorectal cancer. In: Neiderhuber JE, Armitage JO, Dorshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical*

*Oncology*. 5<sup>th</sup> ed. Philadelphia, Pa: Elsevier; 2014: 1278-1335.

Last Medical Review: February 21, 2018 Last Revised: February 21, 2018

---

## Tests to Diagnose and Stage Colorectal Cancer

If you have [symptoms](#) that might be from colorectal cancer, or if a [screening test](#) shows something abnormal, your doctor will recommend one or more of the exams and tests below to find the cause.

### Medical history and physical exam

Your doctor will ask about your medical history to learn about possible risk factors, including your family history. You will also be asked if you're having any symptoms and, if so, when they started and how long you've had them.

As part of a physical exam, your doctor will feel your abdomen for masses or enlarged organs, and also examine the rest of your body. You may also have a digital rectal exam (DRE). During this test, the doctor inserts a lubricated, gloved finger into your rectum to feel for any abnormal areas.

### Tests to look for blood in your stool

If you are seeing the doctor because of symptoms you are having (other than bleeding from your rectum or blood in your stools), he or she may recommend a test to check your stool for blood that isn't visible to the naked eye (occult blood), which might be a sign of cancer. These types of tests – a fecal occult blood test (FOBT) or fecal immunochemical test (FIT) – are done at home, and require you to collect 1 to 3 samples of stool from a bowel movement. For more on how these tests are done, see [Colorectal Cancer Screening Tests](#).

(A stool blood test should **not** be the next test done if you've already had an abnormal screening test, in which case you should have a diagnostic colonoscopy, which is described below.)

## Blood tests

Your doctor might also order certain blood tests to help determine if you have colorectal cancer. These tests also can be used to help monitor your disease if you've been diagnosed with cancer.

**Complete blood count (CBC):** This test measures the different types of cells in your blood. It can show if you have [anemia](#)<sup>1</sup> (too few red blood cells). Some people with colorectal cancer become anemic because the tumor has been bleeding for a long time.

**Liver enzymes:** You may also have a blood test to check your liver function, because colorectal cancer can spread to the liver.

**Tumor markers:** Colorectal cancer cells sometimes make substances called *tumor markers* that can be found in the blood. The most common tumor markers for colorectal cancer are carcinoembryonic antigen (CEA) and CA 19-9.

Blood tests for these tumor markers can sometimes suggest someone might have colorectal cancer, but they can't be used alone to screen for or diagnose cancer. This is because tumor marker levels can sometimes be normal in someone who has cancer and can be abnormal for reasons other than cancer.

Tumor markers are used most often along with other tests to monitor patients who already have been diagnosed with colorectal cancer. They may help show how well treatment is working or provide an early warning that a cancer has returned.

If symptoms or the results of the physical exam or blood tests suggest that you might have colorectal cancer, your doctor could recommend more tests. This most often is colonoscopy, but sometimes other tests may be done first.

## Diagnostic colonoscopy

A diagnostic colonoscopy is just like a screening colonoscopy, but it's done because a person is having symptoms, or because something abnormal was found on another type of screening test.

For this test, the doctor looks at the entire length of the colon and rectum with a colonoscope, a thin, flexible, lighted tube with a small video camera on the end. It is inserted through the anus and into the rectum and the colon. Special instruments can be passed through the colonoscope to biopsy or remove any suspicious-looking areas such as polyps, if needed.

Colonoscopy may be done in a hospital outpatient department, in a clinic, or in a doctor's office.

To learn more about colonoscopy, how it's done, and what to expect if you have one, see [Colorectal Cancer Screening Tests](#).

## Proctoscopy

This test may be done if rectal cancer is suspected. For this test, the doctor looks inside the rectum with a proctoscope, a thin, rigid, lighted tube with a small video camera on the end. It's put in through the anus. The doctor can look closely at the inside lining of the rectum through the scope. The tumor can be seen, measured, and its exact location can be determined. For instance, the doctor can see how close the tumor is to the sphincter muscles that control the passing of stool.

## Biopsy

Usually if a suspected colorectal cancer is found by any screening or diagnostic test, it is biopsied during a colonoscopy. In a biopsy, the doctor removes a small piece of tissue with a special instrument passed through the scope. Less often, part of the colon may need to be surgically removed to make the diagnosis. See [Testing Biopsy and Cytology Specimens for Cancer](#)<sup>2</sup> to learn more about the types of biopsies, how the tissue is used in the lab to diagnose cancer, and what the results may show.

### Lab tests of biopsy samples

Biopsy samples (from colonoscopy or surgery) are sent to the lab where they are looked at closely. Other tests may suggest that colorectal cancer is present, but the only way to be sure is to look at the biopsy samples under a microscope.

If cancer is found, other lab tests may also be done on the biopsy specimens to help better classify the cancer.

**Gene tests:** Doctors may look for specific gene changes in the cancer cells that might affect how the cancer is best treated especially if the cancer has spread (metastasized). For example, doctors now typically test the cells for changes in the *KRAS* and *NRAS* and *BRAF* genes. Some doctors may also test for changes in the *BRAF* gene. Patients whose cancers have mutations in these genes typically do not benefit from treatment with certain [targeted anti-cancer drugs](#)<sup>3</sup>.

**MSI and MMR testing:** Colorectal cancer cells are typically tested to see if they show high levels of gene changes called *microsatellite instability* (MSI). Testing might also be done to see if the cancer cells have changes in any of the mismatch repair (MMR) genes (*MLH1*, *MSH2*, *MSH6*, and *PMS2*).

Changes in MSI or in MMR genes (or both) are often seen in people with [Lynch syndrome](#)<sup>4</sup> (HNPCC). Most colorectal cancers do not have high levels of MSI or changes in MMR genes. But most colorectal cancers that are linked to Lynch syndrome do.

There are 2 possible reasons to test colorectal cancers for MSI or for MMR gene changes:

- To identify patients who should be tested for Lynch syndrome. A diagnosis of Lynch syndrome can help plan other cancer screenings for the patient (for example, women with Lynch syndrome may need to be screened for uterine cancer). Also, if a patient has Lynch syndrome, their relatives could also have it, and may want to be tested for it.
- To determine treatment options for colorectal cancer, where MSI or MMR results could change the way it is treated.

For more on lab tests that might be done on biopsy samples, see [Understanding Your Pathology Report: Colon Pathology](#).<sup>5</sup>

## Imaging tests to look for colorectal cancer

Imaging tests use sound waves, x-rays, magnetic fields, or radioactive substances to create pictures of the inside of your body. Imaging tests may be done for a number of reasons, such as:

- To look at suspicious areas that might be cancer
- To learn how far cancer has spread
- To help determine if treatment is working

## Computed tomography (CT or CAT) scan

A [CT scan](#)<sup>6</sup> uses x-rays to make detailed cross-sectional images of your body. This test can help tell if colon cancer has spread into your liver or other organs.

## Ultrasound

[Ultrasound](#)<sup>7</sup> uses sound waves and their echoes to create images of the inside of the body. A small microphone-like instrument called a *transducer* gives off sound waves and picks up the echoes as they bounce off organs. The echoes are converted by a computer into an image on a screen.

**Abdominal ultrasound:** For this exam, a technician moves the transducer along the skin over your abdomen. This test can be used to look for tumors in your liver, gallbladder, pancreas, or elsewhere in your abdomen, but it can't look for tumors of the colon.

**Endorectal ultrasound:** This test uses a special transducer that is inserted into the rectum. It is used to see how far through the rectal wall a cancer has grown and whether it has reached nearby organs or tissues such as lymph nodes.

**Intraoperative ultrasound:** This exam is done during surgery. The transducer is placed directly against the surface of the liver, making this test very useful for detecting the spread of colorectal cancer to the liver. This allows the surgeon to biopsy the tumor, if one is found, while the patient is asleep.

## Magnetic resonance imaging (MRI) scan

Like CT scans, [MRI scans](#)<sup>8</sup> show detailed images of soft tissues in the body. But MRI scans use radio waves and strong magnets instead of x-rays. A contrast material called *gadolinium* may be injected into a vein before the scan to see details better.

MRI can be used to look at abnormal areas in the liver or the brain and spinal cord that could be cancer spread.

**Endorectal MRI:** MRI scans can be used in patients with rectal cancers to see if the tumor has spread into nearby structures. This can help plan surgery and other treatments. To improve the accuracy of the test, some doctors use endorectal MRI. For this test the doctor places a probe, called an *endorectal coil*, inside the rectum. This stays in place for 30 to 45 minutes during the test and can be uncomfortable.

## Chest x-ray

An [x-ray](#)<sup>9</sup> may be done after colorectal cancer has been diagnosed to see if cancer has spread to the lungs.

## Positron emission tomography (PET) scan

[PET scans](#)<sup>10</sup> usually use a form of radioactive sugar that is put into the blood. Body cells take in different amounts of the sugar, depending on how fast they are growing. Cancer cells, which grow quickly, are more likely to take up larger amounts of the sugar than normal cells. A special camera is used to create a picture of areas of radioactivity in the body.

The picture from a PET scan is not as detailed as a CT or MRI scan, but it provides helpful information about whether abnormal areas seen on these other tests are likely to be cancer or not.

If you have already been diagnosed with cancer, your doctor may use this test to see if the cancer has spread to lymph nodes or other parts of the body. A PET scan can also be useful if your doctor thinks the cancer may have spread but doesn't know where.

**PET/CT scan:** Some machines can do both a PET and CT scan at the same time. This lets the doctor compare areas of higher radioactivity on the PET scan with the more detailed picture of that area on the CT scan.

## Angiography

Angiography is an [x-ray test](#)<sup>11</sup> for looking at blood vessels. A contrast dye is injected into an artery, and then x-rays are taken. The dye outlines the blood vessels on x-rays.

If your cancer has spread to the liver, this test can show the arteries that supply blood to those tumors. This can help surgeons decide if the liver tumors can be removed and if so, it can help plan the operation. Angiography can also help in planning other treatments for cancer spread to the liver, like [embolization](#)<sup>12</sup>.

## Hyperlinks

1. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/low-blood-counts/anemia.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/low-blood-counts/anemia.html)
2. [www.cancer.org/treatment/understanding-your-diagnosis/tests/testing-biopsy-and-cytology-specimens-for-cancer.html](http://www.cancer.org/treatment/understanding-your-diagnosis/tests/testing-biopsy-and-cytology-specimens-for-cancer.html)
3. [www.cancer.org/cancer/colon-rectal-cancer/treating/targeted-therapy.html](http://www.cancer.org/cancer/colon-rectal-cancer/treating/targeted-therapy.html)
4. [www.cancer.org/cancer/colon-rectal-cancer/causes-risks-prevention/risk-factors.html](http://www.cancer.org/cancer/colon-rectal-cancer/causes-risks-prevention/risk-factors.html)
5. [www.cancer.org/treatment/understanding-your-diagnosis/tests/understanding-](http://www.cancer.org/treatment/understanding-your-diagnosis/tests/understanding-)

- [your-pathology-report/colon-pathology.html](#)
6. [www.cancer.org/treatment/understanding-your-diagnosis/tests/ct-scan-for-cancer.html](http://www.cancer.org/treatment/understanding-your-diagnosis/tests/ct-scan-for-cancer.html)
  7. [www.cancer.org/treatment/understanding-your-diagnosis/tests/ultrasound-for-cancer.html](http://www.cancer.org/treatment/understanding-your-diagnosis/tests/ultrasound-for-cancer.html)
  8. [www.cancer.org/treatment/understanding-your-diagnosis/tests/mri-for-cancer.html](http://www.cancer.org/treatment/understanding-your-diagnosis/tests/mri-for-cancer.html)
  9. [www.cancer.org/treatment/understanding-your-diagnosis/tests/x-rays-and-other-radiographic-tests.html](http://www.cancer.org/treatment/understanding-your-diagnosis/tests/x-rays-and-other-radiographic-tests.html)
  10. [www.cancer.org/treatment/understanding-your-diagnosis/tests/nuclear-medicine-scans-for-cancer.html](http://www.cancer.org/treatment/understanding-your-diagnosis/tests/nuclear-medicine-scans-for-cancer.html)
  11. [www.cancer.org/treatment/understanding-your-diagnosis/tests/x-rays-and-other-radiographic-tests.html](http://www.cancer.org/treatment/understanding-your-diagnosis/tests/x-rays-and-other-radiographic-tests.html)
  12. [www.cancer.org/cancer/colon-rectal-cancer/treating/ablation-embolization.html](http://www.cancer.org/cancer/colon-rectal-cancer/treating/ablation-embolization.html)

Last Medical Review: February 21, 2018 Last Revised: August 10, 2018

## Colorectal Cancer Stages

After someone is diagnosed with colorectal cancer, doctors will try to figure out if it has spread, and if so, how far. This process is called *staging*. The stage of a cancer describes how much cancer is in the body. It helps determine how serious the cancer is and [how best to treat it](#)<sup>1</sup>. Doctors also use a cancer's stage when talking about survival statistics.

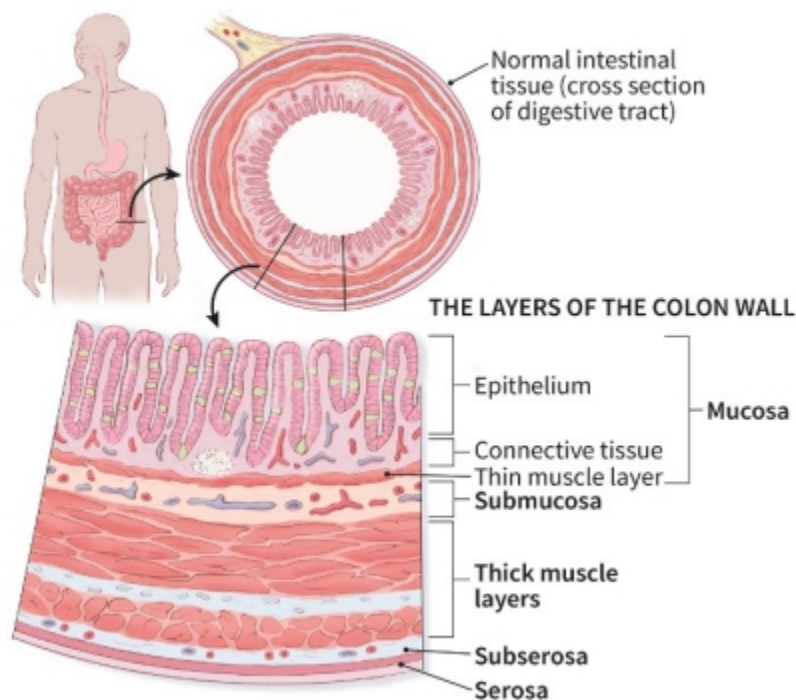
The earliest stage colorectal cancers are called stage 0 (a very early cancer), and then range from stages I (1) through IV (4). As a rule, the lower the number, the less the cancer has spread. A higher number, such as stage IV, means cancer has spread more. And within a stage, an earlier letter means a lower stage. Although each person's cancer experience is unique, cancers with similar stages tend to have a similar outlook and are often treated in much the same way.

### How is the stage determined?

The staging system most often used for colorectal cancer is the American Joint Committee on Cancer (AJCC) **TNM** system, which is based on 3 key pieces of information:



- The extent (size) of the **tumor (T)**: How far has the cancer grown into the wall of the colon or rectum? These layers, from the inner to the outer, include: The inner lining (mucosa), which is the layer in which nearly all colorectal cancers start. This includes a thin muscle layer (muscularis mucosa). The fibrous tissue beneath this muscle layer (submucosa) A thick muscle layer (muscularis propria) The thin, outermost layers of connective tissue (subserosa and serosa) that cover most of the colon but not the rectum



- The spread to nearby lymph **nodes (N)**: Has the cancer spread to nearby lymph nodes?
- The spread (**metastasis**) to distant sites (**M**): Has the cancer spread to distant lymph nodes or distant organs such as the liver or lungs?

The system described below is the most recent AJCC system effective January 2018. It uses the *pathologic stage* (also called the *surgical stage*) which is determined by examining tissue removed during an operation. This is also known as *surgical staging*. This is likely to be more accurate than *clinical staging*, which takes into account the results of a [physical exam, biopsies, and imaging tests](#), done *before* surgery.

Numbers or letters after T, N, and M provide more details about each of these factors. Higher numbers mean the cancer is more advanced. Once a person's T, N, and M

categories have been determined, this information is combined in a process called *stage grouping* to assign an overall stage. For more information see [Cancer Staging<sup>2</sup>](#).

Cancer staging can be complex, so ask your doctor to explain it to you in a way you understand.

<b>AJCC Stage</b>	<b>Stage grouping</b>	<b>Stage description*</b>
<b>0</b>	<b>Tis</b> <b>N0</b> <b>M0</b>	The cancer is in its earliest stage. This stage is also known as carcinoma in situ or intramucosal carcinoma (Tis). It has not grown beyond the inner layer (mucosa) of the colon or rectum.
<b>I</b>	<b>T1 or T2</b> <b>N0</b> <b>M0</b>	The cancer has grown through the muscularis mucosa into the submucosa (T1), and it may also have grown into the muscularis propria (T2). It has not spread to nearby lymph nodes (N0) or to distant sites (M0).
<b>IIA</b>	<b>T3</b> <b>N0</b> <b>M0</b>	The cancer has grown into the outermost layers of the colon or rectum but has not gone through them (T3). It has not reached nearby organs. It has not spread to nearby lymph nodes (N0) or to distant sites (M0).
<b>IIB</b>	<b>T4a</b> <b>N0</b> <b>M0</b>	The cancer has grown through the wall of the colon or rectum but has not grown into other nearby tissues or organs (T4a). It has not yet spread to nearby lymph nodes (N0) or to distant sites (M0).
<b>IIC</b>	<b>T4b</b> <b>N0</b> <b>M0</b>	The cancer has grown through the wall of the colon or rectum and is attached to or has grown into other nearby tissues or organs (T4b). It has not yet spread to nearby lymph nodes (N0) or to distant sites (M0).
	<b>T1 or T2</b> <b>N1/N1c</b> <b>M0</b>	The cancer has grown through the mucosa into the submucosa (T1), and it may also have grown into the muscularis propria (T2). It has spread to 1 to 3 nearby lymph nodes (N1) or into areas of fat near the lymph nodes but not the nodes themselves (N1c). It has not spread to distant sites (M0).

<b>IIIA</b>	<b>OR</b>	
	<b>T1</b> <b>N2a</b> <b>M0</b>	The cancer has grown through the mucosa into the submucosa (T1). It has spread to 4 to 6 nearby lymph nodes (N2a). It has not spread to distant sites (M0).
	<b>T3 or T4a,</b> <b>N1/N1c</b> <b>M0</b>	The cancer has grown into the outermost layers of the colon or rectum (T3) or through the visceral peritoneum (T4a) but has not reached nearby organs. It has spread to 1 to 3 nearby lymph nodes (N1a or N1b) or into areas of fat near the lymph nodes but not the nodes themselves (N1c). It has not spread to distant sites (M0).
<b>IIIB</b>	<b>OR</b>	
	<b>T2 or T3</b> <b>N2a</b> <b>M0</b>	The cancer has grown into the muscularis propria (T2) or into the outermost layers of the colon or rectum (T3). It has spread to 4 to 6 nearby lymph nodes (N2a). It has not spread to distant sites (M0).
	<b>T1 or T2</b> <b>N2b</b> <b>M0</b>	The cancer has grown through the mucosa into the submucosa (T1), and it may also have grown into the muscularis propria (T2). It has spread to 7 or more nearby lymph nodes (N2b). It has not spread to distant sites (M0).
<b>IIIC</b>	<b>T4a</b> <b>N2a</b> <b>M0</b>	The cancer has grown through the wall of the colon or rectum (including the visceral peritoneum) but has not reached nearby organs (T4a). It has spread to 4 to 6 nearby lymph nodes (N2a). It has not spread to distant sites (M0).
	<b>OR</b>	
	<b>T3 or T4a</b> <b>N2b</b> <b>M0</b>	The cancer has grown into the outermost layers of the colon or rectum (T3) or through the visceral peritoneum (T4a) but has not reached nearby organs. It has spread to 7 or more nearby lymph nodes (N2b). It has not spread to distant sites (M0).
	<b>OR</b>	
	<b>T4b</b>	The cancer has grown through the wall of the colon or rectum and

	<b>N1 or N2</b> <b>M0</b>	is attached to or has grown into other nearby tissues or organs (T4b). It has spread to at least one nearby lymph node or into areas of fat near the lymph nodes (N1 or N2). It has not spread to distant sites (M0).
<b>IVA</b>	<b>Any T</b> <b>Any N</b> <b>M1a</b>	The cancer may or may not have grown through the wall of the colon or rectum (Any T). It might or might not have spread to nearby lymph nodes. (Any N). It has spread to 1 distant organ (such as the liver or lung) or distant set of lymph nodes, but not to distant parts of the peritoneum (the lining of the abdominal cavity) (M1a).
<b>IVB</b>	<b>Any T</b> <b>Any N</b> <b>M1b</b>	The cancer might or might not have grown through the wall of the colon or rectum (Any T). It might or might not have spread to nearby lymph nodes (Any N). It has spread to more than 1 distant organ (such as the liver or lung) or distant set of lymph nodes, but not to distant parts of the peritoneum (the lining of the abdominal cavity) (M1b).
<b>IVC</b>	<b>Any T</b> <b>Any N</b> <b>M1c</b>	The cancer might or might not have grown through the wall of the colon or rectum (Any T). It might or might not have spread to nearby lymph nodes (Any N). It has spread to distant parts of the peritoneum (the lining of the abdominal cavity), and may or may not have spread to distant organs or lymph nodes (M1c).

\* The following additional categories are not listed in the table above:

- **TX:** Main tumor cannot be assessed due to lack of information.
- **T0:** No evidence of a primary tumor.
- **NX:** Regional lymph nodes cannot be assessed due to lack of information.

## Hyperlinks

1. [www.cancer.org/cancer/colon-rectal-cancer/treating.html](http://www.cancer.org/cancer/colon-rectal-cancer/treating.html)
2. [www.cancer.org/treatment/understanding-your-diagnosis/staging.html](http://www.cancer.org/treatment/understanding-your-diagnosis/staging.html)

Last Medical Review: February 21, 2018 Last Revised: February 21, 2018

# Survival Rates for Colorectal Cancer

Survival rates can give you an idea of what percentage of people with the same type and stage of cancer are still alive a certain amount of time (usually 5 years) after they were diagnosed. They can't tell you how long you will live, but they may help give you a better understanding of how likely it is that your treatment will be successful.

**Keep in mind that survival rates are estimates and are often based on previous outcomes of large numbers of people who had a specific cancer, but they can't predict what will happen in any particular person's case. These statistics can be confusing and may lead you to have more questions. Talk with your doctor about how these numbers may apply to you, as he or she is familiar with your situation.**

## What is a 5-year relative survival rate?

A **relative survival rate** compares people with the same type and stage of colon or rectal cancer to people in the overall population. For example, if the **5-year relative survival rate** for a specific stage of colon or rectal cancer is 80%, it means that people who have that cancer are, on average, about 80% as likely as people who don't have that cancer to live for at least 5 years after being diagnosed.

## Where do these numbers come from?

The American Cancer Society relies on information from the SEER\* database, maintained by the National Cancer Institute (NCI), to provide survival statistics for different types of cancer.

The SEER database tracks 5-year relative survival rates for colon and rectal cancer in the United States, based on how far the cancer has spread. The SEER database, however, does not group cancers by [AJCC TNM stages](#) (stage 1, stage 2, stage 3, etc.). Instead, it groups cancers into localized, regional, and distant stages:

- **Localized:** There is no sign that the cancer has spread outside of the colon or rectum. This includes AJCC stage I, IIA, and IIB cancers.
- **Regional:** The cancer has spread outside the colon or rectum to nearby structures or lymph nodes. This includes stage IIC and stage III cancers in the AJCC system.
- **Distant:** The cancer has spread to distant parts of the body such as the liver, lungs, or distant lymph nodes. This includes stage IV cancers.

### 5-year relative survival rates for colon cancer

(Based on people diagnosed with cancers of the colon between 2008 and 2014.)

SEER stage	5-year relative survival rate
Localized	90%
Regional	71%
Distant	14%
All SEER stages combined	64%

### 5-year relative survival rates for rectal cancer

(Based on people diagnosed with cancers of the rectum between 2008 and 2014.)

SEER stage	5-year relative survival rate
Localized	89%
Regional	70%
Distant	15%
All SEER stages combined	67%

### Understanding the numbers

- **People now being diagnosed with colon or rectal cancer may have a better outlook than these numbers show.** Treatments improve over time, and these numbers are based on people who were diagnosed and treated at least five years earlier.
- **These numbers apply only to the stage of the cancer when it is first diagnosed.** They do not apply later on if the cancer grows, spreads, or comes back after treatment.
- **These numbers don't take everything into account.** Survival rates are grouped based on how far the cancer has spread, but your age, overall health, how well the

cancer responds to treatment, and other factors will also affect your outlook.

\*SEER = Surveillance, Epidemiology, and End Results

## References

American Cancer Society. *Cancer Facts & Figures 2019*. Atlanta, Ga: American Cancer Society; 2019.

Noone AM, Howlader N, Krapcho M, Miller D, Brest A, Yu M, Ruhl J, Tatalovich Z, Mariotto A, Lewis DR, Chen HS, Feuer EJ, Cronin KA (eds). SEER Cancer Statistics Review, 1975-2015, National Cancer Institute. Bethesda, MD, [https://seer.cancer.gov/csr/1975\\_2015/](https://seer.cancer.gov/csr/1975_2015/), based on November 2017 SEER data submission, posted to the SEER web site, April 2018.

Last Medical Review: February 21, 2018 Last Revised: February 1, 2019

---

# Questions to Ask Your Doctor About Colorectal Cancer

It's important to have frank, open discussions with your cancer care team. They want to answer all of your questions, so that you can make informed treatment and life decisions. For instance, consider these questions:

## When you're told you have colorectal cancer

- Where is the cancer located?
- Has the cancer spread beyond where it started?
- What is the cancer's [stage](#) (extent), and what does that mean?
- Will I need other [tests](#) before we can decide on treatment?

- Do I need to see any other doctors or health professionals?
- If I'm concerned about the costs and insurance coverage for my diagnosis and treatment, who can help me?

### When deciding on a treatment plan

- What are my [treatment options](#)<sup>1</sup>?
- What do you recommend and why?
- How much experience do you have treating this type of cancer?
- Should I get a second opinion? How do I do that? Can you recommend someone?
- What would the goal of the treatment be?
- How quickly do we need to decide on treatment?
- What should I do to be ready for treatment?
- How long will treatment last? What will it be like? Where will it be done?
- What risks or side effects are there to the treatments you suggest? Are there things I can do to reduce these side effects?
- How might treatment affect my daily activities? Can I still work full time?
- What are the chances the cancer will recur (come back) with these treatment plans?
- What will we do if the treatment doesn't work or if the cancer recurs?
- What if I have transportation problems getting to and from treatment?

### During treatment

Once treatment begins, you'll need to know what to expect and what to look for. Not all of these questions may apply to you, but asking the ones that do may be helpful.

- How will we know if the treatment is working?
- Is there anything I can do to help manage side effects?
- What symptoms or side effects should I tell you about right away?
- How can I reach you on nights, holidays, or weekends?
- Do I need to change what I eat during treatment?
- Are there any limits on what I can do?
- Can I exercise during treatment? If so, what kind should I do, and how often?
- Can you suggest a mental health professional I can see if I start to feel overwhelmed, depressed, or distressed?



- What if I need social support during treatment because my family lives far away?

### After treatment

- Do I need a special diet after treatment?
- Are there any limits on what I can do?
- What other symptoms should I watch for?
- What kind of exercise should I do now?
- What type of follow-up will I need after treatment?
- How often will I need to have follow-up exams and imaging tests?
- Will I need any blood tests?
- How will we know if the cancer has come back? What should I watch for?
- What will my options be if the cancer comes back?

Along with these sample questions, be sure to write down some of your own. For instance, you might want more information about recovery times. Or you may want to ask about [clinical trials](#)<sup>2</sup> for which you may qualify.

Keep in mind that doctors aren't the only ones who can give you information. Other health care professionals, such as nurses and social workers, can answer some of your questions. To find out more about speaking with your health care team, see [The Doctor-Patient Relationship](#)<sup>3</sup>.

### Hyperlinks

1. [www.cancer.org/cancer/colon-rectal-cancer/treating.html](http://www.cancer.org/cancer/colon-rectal-cancer/treating.html)
2. [www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html](http://www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html)
3. [www.cancer.org/treatment/understanding-your-diagnosis/talking-about-cancer/the-doctor-patient-relationship.html](http://www.cancer.org/treatment/understanding-your-diagnosis/talking-about-cancer/the-doctor-patient-relationship.html)

Last Medical Review: February 21, 2018 Last Revised: February 21, 2018

### Written by

The American Cancer Society medical and editorial content team  
([www.cancer.org/cancer/acs-medical-content-and-news-staff.html](http://www.cancer.org/cancer/acs-medical-content-and-news-staff.html))

Our team is made up of doctors and oncology certified nurses with deep knowledge of cancer care as well as journalists, editors, and translators with extensive experience in medical writing.

American Cancer Society medical information is copyrighted material. For reprint requests, please see our Content Usage Policy ([www.cancer.org/about-us/policies/content-usage.html](http://www.cancer.org/about-us/policies/content-usage.html)).

**cancer.org | 1.800.227.2345**



# Treating Colorectal Cancer

## Local treatments

Some treatments are called *local therapies*. This means they treat the tumor without affecting the rest of the body. These treatments are more likely to be useful for earlier stage cancers (smaller cancers that haven't spread), but they might also be used in some other situations. Types of local therapy used for colorectal cancer include:

- [Surgery for Colon Cancer](#)
- [Surgery for Rectal Cancer](#)
- [Ablation and Embolization for Colorectal Cancer](#)
- [Radiation Therapy for Colorectal Cancer](#)

## Systemic treatments

Colorectal cancer can also be treated using drugs, which can be given by mouth or directly into the bloodstream. These are called *systemic therapies* because they can reach cancer cells throughout the body. Depending on the type of colorectal cancer, different types of drugs might be used, such as:

- [Chemotherapy for Colorectal Cancer](#)
- [Targeted Therapy Drugs for Colorectal Cancer](#)
- [Immunotherapy for Colorectal Cancer](#)

## Common treatment approaches

Depending on the [stage of the cancer](#)<sup>1</sup> and other factors, different types of treatment may be combined at the same time or used after one another.

- [Treatment of Colon Cancer, by Stage](#)
- [Treatment of Rectal Cancer, by Stage](#)

## Who treats colorectal cancer?

Based on your treatment options, you might have different types of doctors on your treatment team. These doctors could include:

- A **gastroenterologist**: a doctor who treats disorders of the gastrointestinal (GI or digestive) tract
- A **surgical oncologist** (oncologic surgeon): a doctor who uses surgery to treat cancer
- A **colorectal surgeon**: a doctor who uses surgery to treat diseases of the colon and rectum
- A **radiation oncologist**: a doctor who treats cancer with radiation therapy
- A **medical oncologist**: a doctor who treats cancer with medicines such as chemotherapy or targeted therapy

You might have many other specialists on your treatment team as well, including physician assistants (PAs), nurse practitioners (NPs), nurses, psychologists, nutritionists, social workers, and other health professionals.

- [Health Professionals Associated With Cancer Care<sup>2</sup>](#)

## Making treatment decisions

It's important to discuss all of your treatment options, including their goals and possible side effects, with your doctors to help make the decision that best fits your needs. It's also very important to ask questions if there's anything you're not sure about.

If time permits, it is often a good idea to seek a second opinion. A second opinion can give you more information and help you feel more confident about the treatment plan you choose.

- [Questions to Ask Your Doctor About Colorectal Cancer<sup>3</sup>](#)
- [Seeking a Second Opinion<sup>4</sup>](#)

## Thinking about taking part in a clinical trial

Clinical trials are carefully controlled research studies that are done to get a closer look at promising new treatments or procedures. Clinical trials are one way to get state-of-the-art cancer treatment. In some cases they may be the only way to get access to newer treatments. They are also the best way for doctors to learn better methods to treat cancer. Still, they're not right for everyone.

If you would like to learn more about clinical trials that might be right for you, start by asking your doctor if your clinic or hospital conducts clinical trials.

- [Clinical Trials](#)<sup>5</sup>

### **Considering complementary and alternative methods**

You may hear about alternative or complementary methods that your doctor hasn't mentioned to treat your cancer or relieve symptoms. These methods can include vitamins, herbs, and special diets, or other methods such as acupuncture or massage, to name a few.

Complementary methods refer to treatments that are used along with your regular medical care. Alternative treatments are used instead of a doctor's medical treatment. Although some of these methods might be helpful in relieving symptoms or helping you feel better, many have not been proven to work. Some might even be harmful.

Be sure to talk to your cancer care team about any method you are thinking about using. They can help you learn what is known (or not known) about the method, which can help you make an informed decision.

- [Complementary and Alternative Medicine](#)<sup>6</sup>

### **Help getting through cancer treatment**

Your cancer care team will be your first source of information and support, but there are other resources for help when you need it. Hospital- or clinic-based support services are an important part of your care. These might include nursing or social work services, financial aid, nutritional advice, rehab, or spiritual help.

The American Cancer Society also has programs and services – including rides to treatment, lodging, and more – to help you get through treatment. Call our National Cancer Information Center at 1-800-227-2345 and speak with one of our trained specialists.

- [Find Support Programs and Services in Your Area](#)<sup>7</sup>

## Choosing to stop treatment or choosing no treatment at all

For some people, when treatments have been tried and are no longer controlling the cancer, it could be time to weigh the benefits and risks of continuing to try new treatments. Whether or not you continue treatment, there are still things you can do to help maintain or improve your quality of life.

Some people, especially if the cancer is advanced, might not want to be treated at all. There are many reasons you might decide not to get cancer treatment, but it's important to talk to your doctors and you make that decision. Remember that even if you choose not to treat the cancer, you can still get supportive care to help with pain or other symptoms.

- [If Cancer Treatments Stop Working](#)<sup>8</sup>
- [Palliative or Supportive Care](#)<sup>9</sup>

*The treatment information given here is not official policy of the American Cancer Society and is not intended as medical advice to replace the expertise and judgment of your cancer care team. It is intended to help you and your family make informed decisions, together with your doctor. Your doctor may have reasons for suggesting a treatment plan different from these general treatment options. Don't hesitate to ask him or her questions about your treatment options.*

---

## Surgery for Colon Cancer

Surgery is often the main treatment for earlier-stage colon cancers. The type of surgery used depends on the [stage](#)<sup>1</sup> (extent) of the cancer, where it is, and the goal of the surgery.

Any type of colon surgery needs to be done on a clean and empty colon. You will be put on a special diet before surgery and may need to use laxative drinks and enemas to get all of the stool out of your colon. This bowel prep is a lot like the one used before a [colonoscopy](#)<sup>2</sup>.

## Polypectomy and local excision

Some early colon cancers (stage 0 and some early stage I tumors) and most polyps can be removed during a colonoscopy. This is a procedure that uses a long flexible tube with a small video camera on the end that's put into the person's rectum and threaded into the colon. These surgeries can be done during a colonoscopy:

- For a **polypectomy**, the cancer is removed as part of the polyp, which is cut at its stalk (the part that looks like the stem of a mushroom). This is usually done by passing a wire loop through the colonoscope to cut the polyp off the wall of the colon with an electric current.
- A **local excision** is a slightly more involved procedure. Tools are used through the colonoscope to remove small cancers on the inside lining of the colon along with a small amount of surrounding healthy tissue on the wall of colon.

When cancer or polyps are taken out this way, the doctor doesn't have to cut into the abdomen (belly).

## Colectomy

A colectomy is surgery to remove all or part of the colon. Nearby [lymph nodes](#)<sup>3</sup> are also removed.

- If only part of the colon is removed, it's called a **hemicolectomy**, **partial colectomy**, or **segmental resection**. The surgeon takes out the part of the colon with the cancer and a small segment of normal colon on either side. Usually, about one-fourth to one-third of the colon is removed, depending on the size and location of the cancer. The remaining sections of colon are then reattached. At least 12 nearby lymph nodes are also removed so they can be checked for cancer.
- If all of the colon is removed, it's called a **total colectomy**. Total colectomy isn't often needed to treat colon cancer. It's mostly used only if there's another problem in the part of the colon without cancer, such as hundreds of polyps (in someone with [familial adenomatous polyposis](#)<sup>4</sup>) or, sometimes, inflammatory bowel disease.

## How it's done

A colectomy can be done in 2 ways:

- **Open colectomy:** The surgery is done through a single long incision (cut) in the abdomen (belly).
- **Laparoscopic-assisted colectomy:** The surgery is done through many smaller incisions and special tools. A laparoscope is a long, thin lighted tube with a small camera and light on the end that lets the surgeon see inside the abdomen. It's put into one of the small cuts, and long, thin instruments are put in through the others to remove part of the colon and lymph nodes.

Because the incisions are smaller in a laparoscopic-assisted colectomy than in an open colectomy, patients often recover faster and may be able to leave the hospital sooner than they would after an open colectomy. But this type of surgery requires special expertise, and it might not be the best approach for everyone. If you're considering this type of surgery, be sure to look for a skilled surgeon who has done many of these operations.

Overall survival rates and the chance of the cancer returning are much the same between an open colectomy and a laparoscopic-assisted colectomy.

### **If the colon is blocked**

When cancer blocks the colon, it usually happens slowly and the person can become very sick over time. In cases like this, a stent may be placed before surgery is done. A **stent** is a hollow metal or plastic tube that the doctor can put inside the colon and through the blockage using a colonoscope. This tube keeps the colon open and relieves the blockage to help you prepare for surgery.

If a stent can't be placed in a blocked colon or if the tumor has caused a hole in the colon, surgery may be needed right away. This usually is the same type of colectomy that's done to remove the cancer, but instead of reconnecting the ends of the colon, the top end of the colon is attached to an opening (called a stoma) made in the skin of the abdomen. Stool then comes out this opening. This is called a **colostomy** and is usually only needed for a short time. Sometimes the end of the small intestine (the ileum) instead of the colon is connected to a stoma in the skin. This is called an **ileostomy**. Either way, a bag sticks to the skin around the stoma to hold the waste.

Once the patient is healthier, another operation (known as a *colostomy reversal* or *ileostomy reversal*) can be done to put the ends of the colon back together or to attach the ileum to the colon. Rarely, if a tumor can't be removed or a stent placed, the colostomy or ileostomy may need to be permanent.



For more on this, see [Colostomy Guide](#)<sup>5</sup> and [Ileostomy Guide](#)<sup>6</sup>.

## Surgery for colon cancer spread

Some patients have colon cancers that have spread to other parts of the body and also have tumors blocking the colon. In this case, surgery may be done to relieve the blockage without removing the part of the colon containing the cancer. Instead, the colon is cut above the tumor and attached to a stoma (an opening in the skin of the abdomen) to allow stool to come out. This is called a **diverting colostomy**. It can often help the patient recover enough to start other treatments (such as chemotherapy).

If the cancer has spread to only one or a few spots in the lungs or liver (and nowhere else), surgery may be used to remove it. In most cases, this is only done if the cancer in the colon is also being removed (or was already removed). Depending on the extent of the disease, this might help the patient live longer, or it could even cure the cancer. Deciding if surgery is an option to remove areas of cancer spread depends on their size, number, and location.

## Side effects of colon surgery

Possible risks and side effects of surgery depend on several factors, including the extent of the operation and your general health before surgery. Problems during or shortly after the operation can include bleeding, infection, and blood clots in the legs.

When you wake up after surgery, you will have some [pain](#)<sup>7</sup> and will need pain medicines for a few days. For the first couple of days, you may not be able to eat or you may be allowed limited liquids, as the colon needs some time to recover. Most people are able to eat solid food in a few days.

Rarely, the new connections between the ends of the colon may not hold together and may leak. This can quickly cause severe belly pain, fever, and the belly feels very hard. A smaller leak may cause you to not pass stool, have no desire to eat, and not do well or recover after surgery. A leak can lead to infection and more surgery may be needed to fix it. It's also possible that the incision (cut) in the abdomen (belly) might open up, becoming an open wound that may need special care as it heals.

After the surgery, you might develop scar tissue in your abdomen that can cause organs or tissues to stick together. These are called *adhesions*. Normally your intestines freely slide around inside your body. In rare cases, adhesions can cause the bowels to twist up and can even block the bowel. This causes pain and swelling in the belly that's often worse after eating. Further surgery may be needed to remove the scar tissue.

## Colostomy or ileostomy

Some people need a temporary or permanent colostomy (or ileostomy) after surgery. This can take some time to get used to and might require some lifestyle adjustments. If you have a colostomy or ileostomy, you'll need help learning how to manage it. Specially trained ostomy nurses or enterostomal therapists can do this. They'll usually see you in the hospital before your operation to discuss the ostomy and to mark a site for the opening. After the operation they may come to your house or meet with you in an outpatient setting to give you more training. There may also be ostomy support groups you can be part of. This is a good way to learn from people with first-hand experience.

For more information, see [Colostomy Guide](#)<sup>8</sup> and [Ileostomy Guide](#)<sup>9</sup>.

## More information about Surgery

For more general information about surgery as a treatment for cancer, see [Cancer Surgery](#)<sup>10</sup>.

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)<sup>11</sup>.

## Hyperlinks

1. [www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/staged.html](http://www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/staged.html)
2. [www.cancer.org/treatment/understanding-your-diagnosis/tests/endoscopy/colonoscopy.html](http://www.cancer.org/treatment/understanding-your-diagnosis/tests/endoscopy/colonoscopy.html)
3. [www.cancer.org/cancer/cancer-basics/lymph-nodes-and-cancer.html](http://www.cancer.org/cancer/cancer-basics/lymph-nodes-and-cancer.html)
4. [www.cancer.org/cancer/colon-rectal-cancer/causes-risks-prevention/risk-factors.html](http://www.cancer.org/cancer/colon-rectal-cancer/causes-risks-prevention/risk-factors.html)
5. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/ostomies/colostomy.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/ostomies/colostomy.html)
6. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/ostomies/ileostomy.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/ostomies/ileostomy.html)
7. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/pain.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/pain.html)
8. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/ostomies/colostomy.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/ostomies/colostomy.html)
9. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/ostomies/ileostomy.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/ostomies/ileostomy.html)

10. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/surgery.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/surgery.html)
11. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html)

## References

American Society of Clinical Oncology. Colorectal Cancer: Treatment Options. 8/2017. Accessed at [www.cancer.net/cancer-types/colorectal-cancer/treatment-options](http://www.cancer.net/cancer-types/colorectal-cancer/treatment-options) on February 7, 2018.

Encyclopedia of Surgery. Colostomy. Accessed at [www.surgeryencyclopedia.com/Ce-Fi/Colostomy.html](http://www.surgeryencyclopedia.com/Ce-Fi/Colostomy.html) on February 28, 2018.

National Cancer Institute. Colon Cancer Treatment (PDQ®)—Patient Version. December 7, 2017. Accessed at [www.cancer.gov/types/colorectal/patient/colon-treatment-pdq](http://www.cancer.gov/types/colorectal/patient/colon-treatment-pdq) on February 7, 2018.

National Comprehensive Cancer Network, Clinical Practice Guidelines in Oncology (NCCN Guidelines®), Colon Cancer, Version 1.2018 -- January 18, 2018. Accessed at [www.nccn.org/professionals/physician\\_gls/pdf/colon.pdf](http://www.nccn.org/professionals/physician_gls/pdf/colon.pdf) on February 7, 2018.

Hyman N, Manchester TL, Osler T, Burns B, Cataldo PA. Anastomotic Leaks After Intestinal Anastomosis: It's Later Than You Think. *Annals of Surgery*. 2007;245(2);254–258.

Libutti SK, Salz LB, Willett CG, Levine RA. Chapter 57: Cancer of the colon. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

Tong G, Zhang G, Liu J, et al. A meta-analysis of short-term outcome of laparoscopic surgery versus conventional open surgery on colorectal carcinoma. *Medicine (Baltimore)*. 2017;96(48):e8957.

US National Library of Medicine. MedlinePlus. Intestinal obstruction. 2/7/2018. Accessed at <https://medlineplus.gov/ency/article/000260.htm> on February 28, 2018.

Van Schaeybroeck S, Lawler M, Johnston B, et al. Colorectal cancer. In: Neiderhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5th ed. Philadelphia, Pa: Elsevier; 2014: 1278-1335.

Last Medical Review: February 21, 2018 Last Revised: February 21, 2018

## Surgery for Rectal Cancer

Surgery is usually the main treatment for rectal cancer. [Radiation](#) and [chemotherapy](#) are often given before or after surgery. The type of surgery used depends on the [stage](#)<sup>1</sup> (extent) of the cancer, where it is, and the goal of the surgery.

A key piece of information needed before surgery is how close the tumor is to the anus. This can impact the type of surgery done. It can also impact outcomes if the cancer has spread to the ring-like sphincter muscles around the anus that keep stool from coming out until they relax during a bowel movement.

### Polypectomy and local excision

Some early rectal cancers and most polyps can be removed during a [colonoscopy](#)<sup>2</sup>. This is a procedure that uses a long flexible tube with a small video camera on the end that's put into the person's anus and threaded into the rectum. These surgeries can be done during a colonoscopy:

- For a **polypectomy**, the cancer is removed as part of the polyp, which is cut at its stalk (the part that looks like the stem of a mushroom). This is usually done by passing a wire loop through the colonoscope to cut the polyp from the wall of the rectum with an electric current.
- A **local excision** is a slightly more involved procedure. Tools are used through the colonoscope to remove small cancers on the inside lining of the rectum along with a small amount of surrounding healthy tissue on the wall of rectum.

When cancer or polyps are taken out this way, the doctor doesn't have to cut into the abdomen (belly).

### Local transanal resection (full thickness resection)

This procedure can be used to remove some early stage I rectal cancers that are relatively small and not too far from the anus. As with polypectomy and local excision,

local transanal resection (also known as *transanal excision*) is done with instruments that are put into the rectum through the anus. The skin over the abdomen (belly) isn't cut. This procedure can be used to remove some early stage I rectal cancers that are relatively small and not too far from the anus. It's usually done with local anesthesia (numbing medicine) – the patient is not asleep during the operation.

In this operation, the surgeon cuts through all layers of the rectal wall to take out the cancer as well as some surrounding normal rectal tissue. The hole in the rectal wall is then closed.

[Lymph nodes](#)<sup>3</sup> are not removed during this procedure, so if the tumor has grown deep into the rectum, radiation with or without chemotherapy may be recommended after surgery.

### **Transanal endoscopic microsurgery (TEM)**

This operation can sometimes be used for early stage I cancers that are higher in the rectum and can't be reached using the standard transanal resection (see above). A specially designed magnifying scope is put through the anus and into the rectum. This allows the surgeon to do a transanal resection with great precision and accuracy. This operation requires special equipment and surgeons with special training and experience, so it's only done at certain cancer centers.

### **Low anterior resection (LAR)**

Some stage I rectal cancers and most stage II or III cancers in the upper part of the rectum (close to where it connects with the colon) can be removed by low anterior resection (LAR). In this operation, the part of the rectum containing the tumor is removed. The colon is then attached to the remaining part of the rectum (either right away or sometime later) so that the patient moves their bowels in the usual way.

A low anterior resection is done with general anesthesia, the patient is put into a deep sleep and doesn't feel pain. The surgeon makes several small incisions (cuts) in the abdomen. The cancer and a margin (edge or rim) of normal tissue around the cancer is removed, along with nearby lymph nodes and other tissues around the rectum.

The colon is then reattached to the remaining rectum so that a permanent [colostomy](#)<sup>4</sup> is not needed. (A colostomy is needed when, instead of reconnecting the colon and rectum, the top end of the colon is attached to an opening made in the skin of the abdomen. Stool then comes out this opening.)

If radiation and chemotherapy have been given before surgery, it's common for a short-term [ileostomy](#)<sup>5</sup> to be made. (This is where the end of the ileum, the last part of the small intestine, is connected to a hole in the skin of the abdomen.) This gives the rectum time to heal before body waste moves through it again. In most cases, the ileostomy can be reversed (the intestines are reconnected) about 8 weeks later.

Most patients spend several days in the hospital after a low anterior resection, depending on how the surgery was done and their overall health. It could take 3 to 6 weeks to recover at home.

## **Proctectomy with colo-anal anastomosis**

Some stage I and most stage II and III rectal cancers in the middle and lower third of the rectum require removing the entire rectum (called a proctectomy). The rectum has to be removed so that a total mesorectal excision (TME) can be done to remove all of the lymph nodes near the rectum. The colon is then connected to the anus (called a colo-anal anastomosis) so that the patient will move their bowels in the usual way.

Sometimes when a colo-anal anastomosis is done, a small pouch is made by doubling back a short piece of colon (called colonic J-pouch) or by enlarging a segment of the colon (called coloplasty). This small reservoir or pouch of colon becomes a storage space for stool, like the rectum did before surgery. When special techniques are needed to avoid a permanent colostomy, the patient may need a short-term ileostomy (where the end of the ileum, the last part of the small intestine, is connected to a hole in the abdominal skin) for about 8 weeks while the bowel heals. A second operation is then done to reconnect the intestines and close the ileostomy opening.

General anesthesia is used (drugs are used to put the patient into a deep sleep) for this operation. Most patients spend several days in the hospital after surgery, depending on how it was done and their overall health. It could take 3 to 6 weeks to recover at home.

## **Abdominoperineal resection (APR)**

This operation is more involved than a low anterior resection. It can be used to treat some stage I cancers and many stage II or III cancers in the lower part of the rectum (the part close to the anus). It's often needed if the cancer is growing into the sphincter muscle (the muscle that keeps the anus closed and prevents stool leakage) or the nearby muscles that help control urine flow (called levator muscles).

Here, the surgeon makes a cut or incision (or several small incisions) in the skin of the abdomen, and another in the skin around the anus. This allows the surgeon to remove

the rectum, the anus, and the tissues around it, including the sphincter muscle. Because the anus is removed, a permanent colostomy is created (the end of the colon is connected to a hole in the skin over the abdomen) to allow stool to leave the body.

General anesthesia (where the patient is put into a deep sleep) is used for this operation. Most people spend several days in the hospital after an APR, depending on how the surgery is done and their overall health. Recovery time at home may be 3 to 6 weeks.

## Pelvic exenteration

If the rectal cancer is growing into nearby organs, a pelvic exenteration may be recommended. This is major operation. The surgeon will remove the rectum as well as any nearby organs that the cancer has reached, such as the bladder, prostate (in men), or uterus (in women).

A colostomy is needed after pelvic exenteration. If the bladder is removed, a [urostomy](#)<sup>6</sup> is needed, too. (This is an opening in skin of the abdomen where urine leaves the body and is held in a pouch that sticks to the skin.) It can take many months to fully recover from this complicated surgery.

## Diverting colostomy

Some patients have rectal cancers that have spread and also have tumors blocking the rectum. In this case, surgery may be done to relieve the blockage without removing the part of the rectum containing the cancer. Instead, the colon is cut above the tumor and attached to a stoma (an opening in the skin of the abdomen) to allow stool to come out. This is called a *diverting colostomy*. It can often help the patient recover enough to start other treatments (such as [chemotherapy](#)).

## Surgery for rectal cancer spread

If the cancer has spread to just one or a few spots in the lungs or liver (and nowhere else), surgery may be used to remove it. In most cases, this is only done if the main cancer in the rectum is also being removed (or was already removed). Depending on the extent of the disease, this might help the patient live longer, or it could even cure the cancer. Deciding if surgery is an option to remove areas of cancer spread depends on their size, number, and location.

## Side effects of rectal surgery



Possible [risks and side effects of surgery](#)<sup>7</sup> depend on several factors, including the extent of the operation and a person's general health before surgery. Problems during or shortly after the operation can include bleeding from the surgery, infections at the surgery site, and blood clots in the legs.

When you wake up after surgery, you will have some pain and will need pain medicines for a few days. For the first couple of days, you may not be able to eat or you may be allowed limited liquids, as the rectum needs some time to recover. Most people are able to eat solid food again in a few days.

Rarely, the new connections between the ends of the colon may not hold together and may leak. This can quickly cause severe belly pain, fever, and the belly feels very hard. A smaller leak may cause you to not pass stool, have no desire to eat, and not do well or recover after surgery. A leak can lead to infection and more surgery may be needed to fix it. It's also possible that the incision (cut) in the abdomen (belly) might open up, becoming an open wound that may need special care as it heals.

After the surgery, you might develop scar tissue in your abdomen that can cause organs or tissues to stick together. These are called *adhesions*. Normally your intestines freely slide around inside your body. In rare cases, adhesions can cause the bowels to twist up and can even block the bowel. This causes pain and swelling in the belly that's often worse after eating. Further surgery may be needed to remove the scar tissue.

## **Colostomy or ileostomy**

Some people need a temporary or permanent colostomy (or ileostomy) after surgery. This may take some time to get used to and may require some lifestyle adjustments. If you have a colostomy or ileostomy, you will need to learn how to manage it. Specially trained ostomy nurses or enterostomal therapists can help you with this. They'll usually see you in the hospital before your operation to discuss the ostomy and to mark a site for the opening. After your surgery they may come to your house or an outpatient setting to give you more training. There may also be ostomy support groups you can be part of. This is a good way to learn from people with first-hand experience.

For more information, see [Colostomy Guide](#)<sup>8</sup> and [Ileostomy Guide](#)<sup>9</sup>.

## **Sexual function and fertility**

Rectal surgery has been linked to sexual problems and quality of life issues in both men and women. Talk to your doctor about how your body will look and work after surgery. Ask how surgery will impact your sex life. You and your partner should know what you



can expect, for example:

- **If you are a man**, an AP resection (APR) may stop your erections or your ability to reach orgasm. In other cases, your pleasure at orgasm may become less intense. Normal aging may cause some of these changes, but they may be made worse by the surgery. An APR can also affect fertility. Talk with your doctor if you think you might want to father a child in the future. There may still be ways to do this.
- **If you are a woman**, rectal surgery (except pelvic exenteration) usually doesn't cause any loss of sexual function. Abdominal adhesions (scar tissue) may sometimes cause pain or discomfort during sex. If your uterus is removed, you won't be able to get pregnant.

If you have a colostomy, it can have an impact on body image and sexual comfort level in both men and women. While it may require some adjustments, it should not keep you from having an enjoyable sex life.

For more about sexuality and fertility, see [Fertility and Sexual Side Effects](#)<sup>10</sup>.

## More information about Surgery

For more general information about surgery as a treatment for cancer, see [Cancer Surgery](#)<sup>11</sup>.

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)<sup>12</sup>.

## Hyperlinks

1. [www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/staged.html](http://www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/staged.html)
2. [www.cancer.org/treatment/understanding-your-diagnosis/tests/endoscopy/colonoscopy.html](http://www.cancer.org/treatment/understanding-your-diagnosis/tests/endoscopy/colonoscopy.html)
3. [www.cancer.org/cancer/cancer-basics/lymph-nodes-and-cancer.html](http://www.cancer.org/cancer/cancer-basics/lymph-nodes-and-cancer.html)
4. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/ostomies/colostomy.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/ostomies/colostomy.html)
5. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/ostomies/ileostomy.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/ostomies/ileostomy.html)
6. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/ostomies/urostomy.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/ostomies/urostomy.html)

7. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/surgery/risks-of-cancer-surgery.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/surgery/risks-of-cancer-surgery.html)
8. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/ostomies/colostomy.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/ostomies/colostomy.html)
9. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/ostomies/ileostomy.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/ostomies/ileostomy.html)
10. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/fertility-and-sexual-side-effects.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/fertility-and-sexual-side-effects.html)
11. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/surgery.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/surgery.html)
12. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html)

## References

Lee DJ, Sagar PM, Sadacharam G, Tan KY. Advances in surgical management for locally recurrent rectal cancer: How far have we come? *World J Gastroenterol*. 2017;23(23):4170-4180.

Libutti SK, Willett CG, Salz LB, Levine RA. Chapter 60: Cancer of the rectum. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

Ma B, Gao P, Wang H, et al. What has preoperative radio(chemo)therapy brought to localized rectal cancer patients in terms of perioperative and long-term outcomes over the past decades? A systematic review and meta-analysis based on 41,121 patients. *Int J Cancer*. 2017 1;141(5):1052-1065.

National Cancer Institute. Rectal Cancer Treatment (PDQ®)—Patient Version. May 19, 2017. Accessed at [www.cancer.gov/types/colorectal/patient/rectal-treatment-pdq](http://www.cancer.gov/types/colorectal/patient/rectal-treatment-pdq) on February 8, 2018.

National Comprehensive Cancer Network, Clinical Practice Guidelines in Oncology (NCCN Guidelines®), Rectal Cancer, Version 4.2017 -- January 18, 2018. Accessed at [www.nccn.org/professionals/physician\\_gls/pdf/rectal.pdf](http://www.nccn.org/professionals/physician_gls/pdf/rectal.pdf) on February 8, 2018.

Orsini RG, Vermeer TA, Traa MJ, et al. Does extended surgery influence health-related quality of life in patients with rectal cancer? *Dis Colon Rectum*. 2015;58(2):179-185.

Rausa E, Kelly ME, Bonavina L, O'Connell PR, Winter DC. A systematic review examining quality of life following pelvic exenteration for locally advanced and recurrent rectal cancer. *Colorectal Dis.* 2017;19(5):430-436.

São Julião GP, Habr-Gama A, Vailati BB, et al. New Strategies in Rectal Cancer. *Surg Clin North Am.* 2017;97(3):587-604.

Sigurdson ER, Benson AB, Minsky B. Cancer of the rectum. In: Niederhuber JE, Armitage JO, Dorshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5th ed. Philadelphia, Pa. Elsevier: 2014: 1336-1359.

Sun V, Grant M, Wendel CS, et al. Sexual Function and Health-Related Quality of Life in Long-Term Rectal Cancer Survivors. *J Sex Med.* 2016;13(7):1071-1079.

Last Medical Review: February 21, 2018 Last Revised: February 21, 2018

---

## Ablation and Embolization for Colorectal Cancer

When colorectal cancer has spread and there are a few small tumors the liver or lung, these metastases can sometimes be removed by surgery or destroyed by other techniques, such as ablation or embolization.

When all of the primary cancer in the colon or rectum can be removed with surgery, these techniques might be used to destroy small spots of cancer if it has spread.

Ablation and embolization might also be good options for people whose metastatic tumors come back after surgery, whose cancer can't be cured with surgery, or who can't have surgery for other reasons. This might help a person live longer. It can also help treat problems the tumor is causing, like pain.

In most cases, patients don't need to stay in the hospital for these treatments.

### Ablation

Ablation refers to treatments that destroy small (less than 4 cm across) tumors without

removing them. The use of radiofrequency ablation to treat cancer that has spread to the liver is best understood. But there are many different ablation techniques, and ablation can be used to treat tumors in other places, too.

### **Radiofrequency ablation**

Radiofrequency ablation (RFA) uses high-energy radio waves to kill tumors. A [CT scan](#)<sup>1</sup> or [ultrasound](#)<sup>2</sup> is used to guide a thin, needle-like probe through the skin and into the tumor. An electric current is then sent to the tip of the probe, releasing high-frequency radio waves that heat the tumor and destroy the cancer cells.

### **Microwave ablation (MWA)**

This newer ablation method is used to treat cancer that has spread to the liver. Imaging tests are used to guide a needle-like probe into the tumor. Electromagnetic microwaves are then sent through it to create high temperatures that kill tumors quickly. This treatment has been used to treat larger tumors (up to 6 cm across).

### **Ethanol (alcohol) ablation**

In this technique, also known as *percutaneous ethanol injection (PEI)*, concentrated alcohol is put right into the tumor to kill cancer cells. This is usually done through the skin using a needle, which is guided by [ultrasound](#)<sup>3</sup> or [CT scans](#)<sup>4</sup>.

### **Cryosurgery (cryotherapy or cryoablation)**

Cryosurgery destroys the tumor by freezing it with a thin metal probe. The probe is guided through the skin and into the tumor using [ultrasound](#)<sup>5</sup>. Then very cold gasses are passed through the end of the probe to freeze the tumor, killing the cancer cells. This method can treat larger tumors than the other ablation techniques, but it sometimes general anesthesia is needed (drugs are used to put the patient into a deep sleep). Treatment can be repeated as needed to kill all the cancer cells.

### **Side effects of ablation therapy**

Possible [side effects](#)<sup>6</sup> after ablation therapy include:

- Abdominal (belly) pain
- Infection
- Bleeding into the chest cavity or abdomen

Serious complications are rare, but they are possible.

## Embolization

During an embolization procedure, substances are injected into blood vessels to try to block or reduce the blood flow to cancer cells in the liver. This allows doctors to treat the metastatic tumors, while limiting the effects of treatment on the healthy parts of the liver, as well as the rest of the body.

The liver is unusual in that it has 2 blood supplies. Most normal liver cells get blood from branches of the portal vein, but cancer cells in the liver usually get their blood supply from branches of the hepatic artery. Blocking the branch of the hepatic artery that's feeding the tumor helps kill cancer cells, but it leaves most of the healthy liver cells unharmed.

Embolization can be used for tumors that are too big to be treated with ablation – usually larger than 5 cm (about 2 inches) across. It can also be used along with ablation. Embolization does reduce some of the blood supply to the normal liver tissue, so it may not be a good option for patients with liver damage from diseases like hepatitis or cirrhosis.

There are 3 main types of embolization procedures used to treat colorectal cancer that has spread (metastasized) to the liver:

- **Arterial embolization** is also called *trans-arterial embolization* or *TAE*. In this procedure a catheter (a thin, flexible tube) is put into an artery through a small cut in the inner thigh and threaded up into the hepatic artery in the liver. A dye is usually injected into the blood at this time to help the doctor monitor the path of the catheter using [x-ray](#)<sup>7</sup> pictures. Once the catheter is in the right place, tiny particles are injected into the artery to plug it up.
- **Chemoembolization** (also called *trans-arterial chemoembolization* or *TACE*) combines embolization with chemotherapy. Multiple treatments may be given over 4 to 6 weeks. Most often, this is done by using tiny beads that give off a chemotherapy drug for the embolization. TACE can also be done by giving chemotherapy through a catheter that's put right into the artery that feeds the tumor, then plugging up the artery. The catheter is threaded up into the hepatic artery in the liver through a small cut in the inner thigh.
- **Radioembolization** is a combination of embolization and radiation therapy. In the United States, it's done by injecting tiny beads (called *microspheres*) coated with

radioactive yttrium-90 into the hepatic artery. The beads lodge in the blood vessels near the tumor. There, they give off small amounts of radiation for several days. The radiation travels a very short distance, so its effects are limited mainly to the tumor.

## Side effects of embolization

Possible [side effects](#)<sup>8</sup> after embolization include:

- Belly (abdominal) pain
- Fever
- Nausea
- Infection in the liver
- Gallbladder inflammation
- Blood clots in the main blood vessels of the liver

Because healthy liver tissue can be affected, there is a risk that liver function will get worse after embolization. This risk is higher if a large branch of the hepatic artery is used. Serious complications don't happen often, but they are possible.

## Hyperlinks

1. [www.cancer.org/treatment/understanding-your-diagnosis/tests/ct-scan-for-cancer.html](http://www.cancer.org/treatment/understanding-your-diagnosis/tests/ct-scan-for-cancer.html)
2. [www.cancer.org/treatment/understanding-your-diagnosis/tests/ultrasound-for-cancer.html](http://www.cancer.org/treatment/understanding-your-diagnosis/tests/ultrasound-for-cancer.html)
3. [www.cancer.org/treatment/understanding-your-diagnosis/tests/ultrasound-for-cancer.html](http://www.cancer.org/treatment/understanding-your-diagnosis/tests/ultrasound-for-cancer.html)
4. [www.cancer.org/treatment/understanding-your-diagnosis/tests/ct-scan-for-cancer.html](http://www.cancer.org/treatment/understanding-your-diagnosis/tests/ct-scan-for-cancer.html)
5. [www.cancer.org/treatment/understanding-your-diagnosis/tests/ultrasound-for-cancer.html](http://www.cancer.org/treatment/understanding-your-diagnosis/tests/ultrasound-for-cancer.html)
6. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html)
7. [www.cancer.org/treatment/understanding-your-diagnosis/tests/x-rays-and-other-radiographic-tests.html](http://www.cancer.org/treatment/understanding-your-diagnosis/tests/x-rays-and-other-radiographic-tests.html)
8. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html)

## References

Boas FE, Bodei L, Sofocleous CT. Radioembolization of Colorectal Liver Metastases: Indications, Technique, and Outcomes. *J Nucl Med.* 2017;58(Suppl 2):104S-111S.

Gruber-Rouh T, Marko C, Thalhammer A, et al. Current strategies in interventional oncology of colorectal liver metastases. *Br J Radiol.* 2016;89:20151060.

Li L, Wu K, Lai H, Zhang B. Clinical Application of CT-Guided Percutaneous Microwave Ablation for the Treatment of Lung Metastasis from Colorectal Cancer. *Gastroenterol Res Pract.* 2017;2017:9621585.

Libutti SK, Salz LB, Willett CG, Levine RA. Chapter 57: Cancer of the colon. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology.* 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

Libutti SK, Willett CG, Salz LB, Levine RA. Chapter 60: Cancer of the rectum. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology.* 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

National Comprehensive Cancer Network, Clinical Practice Guidelines in Oncology (NCCN Guidelines®), Colon Cancer, Version 1.2018 -- January 18, 2018. Accessed at [www.nccn.org/professionals/physician\\_gls/pdf/colon.pdf](http://www.nccn.org/professionals/physician_gls/pdf/colon.pdf) on February 9, 2017.

National Comprehensive Cancer Network, Clinical Practice Guidelines in Oncology (NCCN Guidelines®), Rectal Cancer, Version 4.2017 -- January 18, 2018. Accessed at [www.nccn.org/professionals/physician\\_gls/pdf/rectal.pdf](http://www.nccn.org/professionals/physician_gls/pdf/rectal.pdf) on February 9, 2017.

Sigurdson ER, Benson AB, Minsky B. Cancer of the rectum. In: Niederhuber JE, Armitage JO, Dorshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology.* 5th ed. Philadelphia, Pa. Elsevier; 2014: 1336-1359.

Song P, Sheng L, Sun Y, et al. The clinical utility and outcomes of microwave ablation for colorectal cancer liver metastases. *Oncotarget.* 2017;8(31):51792-51799.

Van Schaeybroeck S, Lawler M, Johnston B, et al. Colorectal cancer. In: Neiderhuber JE, Armitage JO, Dorshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology.* 5th ed. Philadelphia, Pa: Elsevier; 2014: 1278-1335.

Last Medical Review: February 21, 2018 Last Revised: February 21, 2018

# Radiation Therapy for Colorectal Cancer

Radiation therapy uses high-energy rays (such as x-rays) or particles to destroy cancer cells. It's more often used to treat people with rectal cancer than for people with colon cancer. For some colon and rectal cancers, treating with [chemotherapy](#) at the same time can make radiation therapy work even better. Using these 2 treatments together is called **chemoradiation** or **chemoradiotherapy**.

## When is radiation therapy used for colorectal cancer?

### Radiation for colon cancer

It's not common to use radiation therapy to treat **colon cancer**, but it may be used in select cases:

- Before surgery (along with chemo) to help shrink a tumor and make it easier to remove.
- After [surgery](#), if the cancer has attached to an internal organ or the lining of the belly (abdomen). If this happens, the surgeon can't be sure that all the cancer has been removed. Radiation therapy may be used to try to kill any cancer cells that may have been left behind.
- During surgery, right to the area where the tumor was, to kill any cancer cells that may be left behind. This is called intraoperative radiation therapy or IORT.
- Along with chemo to help control cancers if a person is not healthy enough for surgery.
- To ease symptoms if advanced cancer is causing intestinal blockage, bleeding, or pain.
- To help treat cancer that has spread to other areas, such as the bones or brain.

### Radiation for rectal cancer

For **rectal cancer**, radiation therapy is a more common treatment and may be used:

- Either before and/or after surgery to help keep the cancer from coming back. In this case, it's often given along with chemotherapy. Many doctors now favor giving radiation therapy before surgery, as it may make it easier to remove the cancer, especially if the cancer's size and/or location might make surgery difficult. In either



case, nearby lymph nodes are usually treated too.

- During surgery, right to the area where the tumor was, to kill any cancer cells that may be left behind. This is called intraoperative radiation therapy or IORT.
- With or without chemo to help control rectal cancers if a person is not healthy enough for surgery or to ease symptoms if advanced cancer is causing intestinal blockage, bleeding, or pain.
- To retreat tumors that come back in the pelvis after radiation was given.
- To help treat cancer that has spread to other areas, such as the bones or brain.

## Types of radiation therapy

Different types of radiation therapy can be used to treat colon and rectal cancers.

### External-beam radiation therapy (EBRT)

This is the type of radiation therapy used most often for people with colon or rectal cancer. The radiation is focused on the cancer from a machine outside the body. It's a lot like getting an x-ray, but the radiation is more intense. How often and how long a person gets radiation treatments depends on the reason the radiation is being given and other factors. Treatments might be given over the course of a few days or several weeks.

### Internal radiation therapy (brachytherapy)

This type of radiation therapy might be used to treat some rectal cancers, but more research is needed to understand how to best use and when to use brachytherapy.

For this treatment, a radioactive source is put inside your rectum next to or into the tumor. This allows the radiation to reach the rectum without passing through the skin and other tissues of the belly (abdomen), so it's less likely to damage nearby tissues.

**Endocavitary radiation therapy:** For this treatment, a small balloon-like device is placed through the anus and into the rectum to deliver high-intensity radiation for a few minutes. This is typically done in 4 treatments (or less), with about 2 weeks between each treatment. This can let some patients, particularly elderly patients, avoid major surgery and a colostomy. This type of treatment is used for some small rectal cancers. Sometimes external-beam radiation therapy is also given.

**Interstitial brachytherapy:** For this treatment, a tube is placed into the rectum and

right into the tumor. Small pellets of radioactive material are then put into the tube for several minutes. The radiation travels only a short distance, limiting the harmful effects on nearby healthy tissues. It's sometimes used to treat people with rectal cancer who are not healthy enough for surgery. This can be done a few times a week for a couple of weeks, but it can also be just a one-time procedure.

## Radioembolization

Radiation can also be given during an embolization procedure. You can find more details in [Ablation and Embolization to Treat Colorectal Cancer](#).

## Side effects of radiation therapy

If you're going to get radiation therapy, it's important to ask your doctor beforehand about the possible short- and long-term side effects so that you know what to expect. Possible side effects of radiation therapy for colon and rectal cancer can include:

- Skin irritation at the site where radiation beams were aimed, which can range from redness to blistering and peeling
- Problems with wound healing if radiation was given before surgery
- Nausea
- Rectal irritation, which can cause diarrhea, painful bowel movements, or blood in the stool
- Bowel incontinence (stool leakage)
- Bladder irritation, which can cause problems like feeling like you have to go often (called frequency), burning or pain while urinating, or blood in the urine
- Fatigue/tiredness
- Sexual problems (erection issues in men and vaginal irritation in women)
- Scarring, fibrosis (stiffening), and adhesions that cause the tissues in the treated area to stick to each other

Most side effects should get better over time after treatment ends, but some problems may not go away completely. If you notice any side effects, talk to your doctor right away so steps can be taken to reduce or relieve them.

## More information about radiation therapy

To learn more about how radiation is used to treat cancer, see [Radiation Therapy](#)<sup>1</sup>.

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)<sup>2</sup>.

## Hyperlinks

1. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/radiation.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/radiation.html)
2. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html)

Last Medical Review: February 21, 2018 Last Revised: February 21, 2018

---

# Chemotherapy for Colorectal Cancer

Chemotherapy (chemo) is often used to treat colorectal cancer. It's the use of drugs to kill cancer cells.

## How is chemotherapy given?

You can get chemotherapy in different ways.

- **Systemic chemotherapy:** Drugs are put right into your blood through a vein or you take them by mouth. The drugs enter your bloodstream and reach all areas of your body. This can help reduce the risk of colorectal cancer spreading to other parts of the body.
- **Regional chemotherapy:** Drugs are put right into an artery that leads to the part of the body with the tumor. This focuses the chemo on the cancer cells in that area. It reduces side effects by limiting the amount of drug reaching the rest of your body. **Hepatic artery infusion**, or chemo given directly into the hepatic artery, is an example of regional chemotherapy sometimes used for cancer that has spread to the liver.

Doctors give chemo in cycles, with each treatment followed by a rest period to give the body time to recover. Chemotherapy cycles generally last about 2 to 4 weeks. People usually get at least several cycles of treatment.

## When is chemotherapy used for colorectal cancer?

Chemo may be used at different times during treatment for colorectal cancer:

- **Adjuvant chemo** is given after surgery. The goal is to kill any cancer cells that might have been left behind at surgery because they were too small to see, as well as cancer cells that might have escaped from the main tumor and settled in other parts of the body but are too small to see on imaging tests. This helps lower the chance that the cancer will come back.
- **Neoadjuvant chemo** is given (sometimes with radiation) before surgery to try to shrink the cancer and make it easier to remove. This is often done for rectal cancer.
- **For advanced cancers** that have spread to other organs like the liver, chemo can be used to help shrink tumors and ease problems they're causing. While it's not likely to cure the cancer, this often helps people feel better and live longer.

## Drugs used to treat colorectal cancer

Some drugs commonly used for colorectal cancer include:

- **5-Fluorouracil (5-FU)**
- **Capecitabine (Xeloda)**, which is in pill form. Once in the body, it is changed to 5-FU when it gets to the tumor site.
- **Irinotecan (Camptosar)**
- **Oxaliplatin (Eloxatin)**
- **Trifluridine and tipiracil (Lonsurf)**, a combination drug in pill form

In most cases, 2 or more of these drugs are combined, which makes them work better. Sometimes, chemo drugs are given along with a [targeted therapy](#) drug.

## Side effects of chemo

Chemo drugs attack cells that are dividing quickly, which is why they work against cancer cells. But other cells in the body, such as those in the bone marrow (where new blood cells are made), the lining of the mouth and intestines, and the hair follicles, are also dividing quickly. These cells can be affected by chemo too, which can lead to side effects.

The side effects of chemo depend on the type and dose of drugs given and how long you take them. Common side effects of chemo can include:

- Hair loss
- Mouth sores
- Loss of appetite
- Nausea and vomiting
- Diarrhea
- Increased chance of infections (from having too few white blood cells)
- Easy bruising or bleeding (from having too few blood platelets)
- Fatigue (from having too few red blood cells)

Other side effects are specific to certain drugs. For example:

- **Hand-foot syndrome** can develop during treatment with capecitabine or 5-FU (when given as an infusion). It can start out as redness in the hands and feet, and then progress to pain and sensitivity in the palms and soles. If it worsens, the skin may blister or peel, sometimes leading to painful sores. It's important to tell your doctor right away about any early symptoms, such as redness or sensitivity, so that steps can be taken to keep things from getting worse.
- **Neuropathy** (nerve damage) is a common side effect of oxaliplatin. Symptoms include numbness, tingling, and even pain in the hands and feet. It can also cause intense sensitivity to hot and cold in your throat, esophagus (the tube connecting the throat to the stomach), and the palms of your hands. This can cause pain when swallowing liquids or holding a cold glass. If you'll be getting oxaliplatin, talk with your doctor about side effects beforehand, and let him or her know right away if you develop numbness and tingling or other side effects.
- **Allergic or sensitivity reactions** can happen in some people while getting the drug oxaliplatin. Symptoms can include skin rash; chest tightness and trouble breathing; back pain; or feeling dizzy, lightheaded, or weak. Be sure to tell your nurse right away if you notice any of these symptoms while you're getting chemo.
- **Diarrhea** is a common side effect with many of these drugs, but can be particularly bad with irinotecan. It needs to be treated right away — at the first loose stool — to prevent severe dehydration. This often means taking a drug like loperamide (Imodium). If you're getting a chemo drug that will likely cause diarrhea, your doctor will give you instructions on what drugs to take and how often to take them to control this problem.

Most of these side effects tend to go away over time after treatment ends. Some, such as hand and foot numbness from oxaliplatin, may last for a long time. There are often ways to ease these side effects. For example, you can be given drugs to help prevent or reduce nausea and vomiting.

Be sure to discuss any questions about side effects with your cancer care team. Also report any side effects or changes you notice while getting chemo so that they can be treated right away. In some cases, the doses of the chemo drugs may need to be reduced or treatment may need to be delayed or stopped to help keep the problem from getting worse.

Older people seem to be able to tolerate some types of chemo for colorectal cancer fairly well. Age is no reason to withhold treatment in otherwise healthy people.

## More information about chemotherapy

For more general information about how chemotherapy is used to treat cancer, see [Chemotherapy](#)<sup>1</sup>.

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)<sup>2</sup>.

## Hyperlinks

1. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/chemotherapy.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/chemotherapy.html)
2. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html)

Last Medical Review: February 21, 2018 Last Revised: February 21, 2018

---

# Targeted Therapy Drugs for Colorectal Cancer

As researchers have learned more about the gene and protein changes in cells that cause colorectal cancer, they have developed newer drugs to specifically target these changes. Targeted therapy drugs work differently from standard [chemotherapy](#) (chemo)

drugs. They sometimes work when standard chemo drugs don't, and they often have different (and less severe) side effects. They can be used either along with chemo or by themselves if chemo is no longer working.

## Drugs that target blood vessel formation (VEGF)

Vascular endothelial growth factor (VEGF) is a protein that helps tumors form new blood vessels (a process known as *angiogenesis*) to get nutrients they need to grow. Drugs that stop VEGF from working can be used to treat some colon or rectal cancers. These include:

- **Bevacizumab (Avastin)**
- **Ramucirumab (Cyramza)**
- **Ziv-aflibercept (Zaltrap)**

These drugs are given as infusions into your vein (IV) every 2 or 3 weeks, in most cases along with chemotherapy. When combined with chemo, these drugs can often help people with advanced colon or rectal cancers live longer.

## Possible side effects of drugs that target VEGF

Common side effects of these drugs include:

- High blood pressure
- Extreme tiredness (fatigue)
- Bleeding
- Low white blood cell counts (with increased risk of infections)
- Headaches
- Mouth sores
- Loss of appetite
- Diarrhea

Rare but possibly serious side effects include blood clots, severe bleeding, holes forming in the colon (called *perforations*), heart problems, kidney problems, and slow wound healing. If a hole forms in the colon it can lead to severe infection and surgery may be needed to fix it.

Another rare but serious side effect of these drugs is an allergic reaction during the infusion, which could cause problems with breathing and low blood pressure.

## Drugs that target cells with EGFR changes

Epidermal growth factor receptor (EGFR) is a protein that helps cancer cells grow. There's often a lot of it on the surface of cancer cells. Drugs that target EGFR can be used to treat some advanced colon or rectal cancers. These include:

- **Cetuximab (Erbix)**
- **Panitumumab (Vectibix)**

Both of these drugs are given by IV infusion, either once a week or every other week.

These drugs don't work in colorectal cancers that have mutations (defects) in the *KRAS*, *NRAS* or *BRAF* gene. Doctors now commonly test the tumor for these gene changes before treatment, and only use these drugs in people who don't have these mutations.

### Possible side effects of drugs that target EGFR

The most common side effects of these drugs are skin problems such as an acne-like rash on the face and chest during treatment, which can sometimes lead to infections. An antibiotic cream or ointment may be needed to help limit the rash and related infections. The skin problems with panitumumab can be more serious and might lead to the skin peeling off. Other side effects can include:

- Headache
- Tiredness
- Fever
- Diarrhea

A rare but serious side effect of these drugs is an allergic reaction during the infusion, which could cause problems with breathing and low blood pressure. You may be given medicine before treatment to help prevent this.

### Other targeted therapy drugs

**Regorafenib (Stivarga)** is a type of targeted therapy known as a *kinase inhibitor*. Kinases are proteins on or near the surface of a cell that carry important signals to the cell's control center. Regorafenib blocks several kinase proteins that either help tumor cells grow or help form new blood vessels to feed the tumor. Blocking these proteins can help stop the growth of cancer cells.



This drug is used to treat advanced colorectal cancer, typically when other drugs are no longer helpful. It's taken as a pill.

Common side effects include fatigue, loss of appetite, hand-foot syndrome (redness and irritation of the hands and feet), diarrhea, high blood pressure, weight loss, and abdominal pain.

Less common but more serious side effects can include severe bleeding or perforations (holes) in the stomach or intestines.

## More information about targeted therapy

To learn more about how targeted drugs are used to treat cancer, see [Targeted Cancer Therapy](#)<sup>1</sup>.

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)<sup>2</sup>.

## Hyperlinks

1. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/targeted-therapy.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/targeted-therapy.html)
2. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html)

## References

Libutti SK, Salz LB, Willett CG, Levine RA. Chapter 57: Cancer of the colon. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

Libutti SK, Willett CG, Salz LB, Levine RA. Chapter 60: Cancer of the rectum. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

National Cancer Institute. Colon Cancer Treatment (PDQ®)—Patient Version. December 7, 2017. Accessed at [www.cancer.gov/types/colorectal/patient/colon-treatment-pdq](http://www.cancer.gov/types/colorectal/patient/colon-treatment-pdq) on February 12, 2018.

National Cancer Institute. Rectal Cancer Treatment (PDQ®)—Patient Version. May 19, 2017. Accessed at [www.cancer.gov/types/colorectal/patient/rectal-treatment-pdq](http://www.cancer.gov/types/colorectal/patient/rectal-treatment-pdq) on February , 2018.

National Comprehensive Cancer Network, Clinical Practice Guidelines in Oncology (NCCN Guidelines®), Colon Cancer, Version 1.2018 -- January 18, 2018. Accessed at [www.nccn.org/professionals/physician\\_gls/pdf/colon.pdf](http://www.nccn.org/professionals/physician_gls/pdf/colon.pdf) on February 12, 2018.

National Comprehensive Cancer Network, Clinical Practice Guidelines in Oncology (NCCN Guidelines®), Rectal Cancer, Version 4.2017 -- January 18, 2018. Accessed at [www.nccn.org/professionals/physician\\_gls/pdf/rectal.pdf](http://www.nccn.org/professionals/physician_gls/pdf/rectal.pdf) on February 12, 2018.

Riley JM, Cross AW, Paulos CM, et al. The clinical implications of immunogenomics in colorectal cancer: A path for precision medicine. *Cancer*. 2018 Jan 9.

Sigurdson ER, Benson AB, Minsky B. Cancer of the rectum. In: Niederhuber JE, Armitage JO, Dorshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5th ed. Philadelphia, Pa. Elsevier: 2014: 1336-1359.

Van Schaeybroeck S, Lawler M, Johnston B, et al. Colorectal cancer. In: Neiderhuber JE, Armitage JO, Dorshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5th ed. Philadelphia, Pa: Elsevier; 2014: 1278-1335.

Wright M, Beaty JS, Ternent CA. Molecular Markers for Colorectal Cancer. *Surg Clin North Am*. 2017;97(3):683-701.

Last Medical Review: February 21, 2018 Last Revised: February 21, 2018

---

## Immunotherapy for Colorectal Cancer

Immunotherapy is the use of medicines to help a person's own immune system better recognize and destroy cancer cells. Immunotherapy can be used to treat some people with advanced colorectal cancer.

### Immune checkpoint inhibitors

An important part of the immune system is its ability to keep itself from attacking the

body's normal cells. To do this, it uses “checkpoint” proteins on immune cells, which act like switches that need to be turned on (or off) to start an immune response. Cancer cells sometimes use these checkpoints to keep the immune system from attacking them. But drugs that target these checkpoints hold a lot of promise as cancer treatments.

Drugs called **checkpoint inhibitors** can be used for people whose colorectal cancer cells have [tested positive for specific gene changes](#)<sup>1</sup>, such as a high level of *microsatellite instability (MSI-H)*, or changes in one of the *mismatch repair (MMR)* genes. The drugs are used for people whose cancer is still growing after treatment with [chemotherapy](#). They might also be used to treat people whose cancer can't be removed with surgery, has come back (recurred) after treatment, or has spread to other parts of the body (metastasized).

### PD-1 inhibitors

**Pembrolizumab (Keytruda)** and **nivolumab (Opdivo)** are drugs that target PD-1, a protein on immune system cells called T cells that normally help keep these cells from attacking other cells in the body. By blocking PD-1, these drugs boost the immune response against cancer cells.

These drugs are given as an intravenous (IV) infusion every 2 or 3 weeks.

Side effects of these drugs can include fatigue, cough, nausea, itching, skin rash, decreased appetite, constipation, joint pain, and diarrhea.

Other, more serious side effects occur less often. These drugs work by basically removing the brakes from the body's immune system. Sometimes the immune system starts attacking other parts of the body, which can cause serious or even life-threatening problems in the lungs, intestines, liver, hormone-making glands, kidneys, or other organs.

### CTLA-4 inhibitor

**Ipilimumab (Yervoy)** is another drug that boosts the immune response, but it has a different target. It blocks CTLA-4, another protein on T cells that normally helps keep them in check.

This drug can be used along with nivolumab (Opdivo) to treat colorectal cancer, but it's not used alone. It is given as an intravenous (IV) infusion, usually once every 3 weeks for 4 treatments.

The most common side effects from this drug include fatigue, diarrhea, skin rash, and itching.

Serious side effects seem to happen more often with this drug than with the PD-1 inhibitors. Like the PD-1 inhibitors, this drug can cause the immune system to attack other parts of the body, which can lead to serious problems in the intestines, liver, hormone-making glands, nerves, skin, eyes, or other organs. In some people these side effects can be life threatening.

It's very important to report any new side effects during or after treatment with any of these drugs to your health care team promptly. If serious side effects do occur, you may need to stop treatment and take high doses of corticosteroids to suppress your immune system.

## More information about immunotherapy

To learn more about how drugs that work on the immune system are used to treat cancer, see [Cancer Immunotherapy](#)<sup>2</sup>.

To learn about some of the side effects listed here and how to manage them, see [Managing Cancer-related Side Effects](#)<sup>3</sup>.

## Hyperlinks

1. [www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/how-diagnosed.html](http://www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/how-diagnosed.html)
2. [www.cancer.org/treatment/treatments-and-side-effects/treatment-types/immunotherapy.html](http://www.cancer.org/treatment/treatments-and-side-effects/treatment-types/immunotherapy.html)
3. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html)

## References

Bristol-Myers Squibb. Opdivo. Accessed at [www.opdivo.com](http://www.opdivo.com) on February 14, 2018.

Merck Sharp & Dohme Corp. Keytruda. Accessed at [www.keytruda.com](http://www.keytruda.com) on February 14, 2018.

National Comprehensive Cancer Network, Clinical Practice Guidelines in Oncology (NCCN Guidelines®), Colon Cancer, Version 1.2018 -- January 18, 2018. Accessed at [www.nccn.org/professionals/physician\\_gls/pdf/colon.pdf](http://www.nccn.org/professionals/physician_gls/pdf/colon.pdf) on February 14, 2018.

National Comprehensive Cancer Network, Clinical Practice Guidelines in Oncology (NCCN Guidelines®), Rectal Cancer, Version 4.2017 -- January 18, 2018. Accessed at [www.nccn.org/professionals/physician\\_gls/pdf/rectal.pdf](http://www.nccn.org/professionals/physician_gls/pdf/rectal.pdf) on February 14, 2018.

Overman MJ et al. Nivolumab in patients with metastatic DNA mismatch repair-deficient or microsatellite instability-high colorectal cancer (CheckMate 142): an open-label, multicentre, phase 2 study. *Lancet Oncol*. 2017 Jul 19.

US Food and Drug Administration. FDA approves first cancer treatment for any solid tumor with a specific genetic feature. [News Release] 2017. Accessed at [www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm560167.htm](http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm560167.htm) on May 24, 2017.

US Food and Drug Administration. FDA grants nivolumab accelerated approval for MSI-H or dMMR colorectal cancer. [News Release] 2017. Accessed at [www.fda.gov/drugs/informationondrugs/approveddrugs/ucm569366.htm](http://www.fda.gov/drugs/informationondrugs/approveddrugs/ucm569366.htm) on August 23, 2017.

Last Medical Review: February 21, 2018 Last Revised: July 13, 2018

---

## Treatment of Colon Cancer, by Stage

Treatment for colon cancer is based largely on the [stage](#)<sup>1</sup> (extent) of the cancer, but other factors can also be important.

People with colon cancers that have not spread to distant sites usually have [surgery](#) as the main or first treatment. [Chemotherapy](#) may also be used after surgery (called adjuvant treatment). Most adjuvant treatment is given for about 6 months.

### Treating stage 0 colon cancer

Since stage 0 colon cancers have not grown beyond the inner lining of the colon, surgery to take out the cancer is often the only treatment needed. In most cases this can be done by removing the polyp or taking out the area with cancer through a colonoscope (local excision). Removing part of the colon (partial colectomy) may be needed if a tumor is too big to be removed by local excision.

## Treating stage I colon cancer

Stage I colon cancers have grown deeper into the layers of the colon wall, but they have not spread outside the colon wall itself or into the nearby lymph nodes.

Stage I includes cancers that were part of a polyp. If the polyp is removed completely during colonoscopy, with no cancer cells at the edges (margins) of the removed piece, no other treatment may be needed.

If the cancer in the polyp is high grade (see [Colorectal Cancer Stages<sup>2</sup>](#) for more on this), or there are cancer cells at the edges of the polyp, more surgery might be recommended. You might also be advised to have more surgery if the polyp couldn't be removed completely or if it had to be removed in many pieces, making it hard to see if cancer cells were at the edges.

For cancers not in a polyp, partial colectomy surgery to remove the section of colon that has cancer and nearby lymph nodes is the standard treatment. You typically won't need any more treatment.

## Treating stage II colon cancer

Many stage II colon cancers have grown through the wall of the colon, and maybe into nearby tissue, but they have not spread to the lymph nodes.

Surgery to remove the section of the colon containing the cancer (partial colectomy) along with nearby lymph nodes may be the only treatment needed. But your doctor may recommend adjuvant chemotherapy (chemo after surgery) if your cancer has a higher risk of coming back (recurring) because of certain factors, such as:

- The cancer looks very abnormal (is high grade) when viewed under a microscope.
- The cancer has grown into nearby blood or lymph vessels.
- The surgeon did not remove at least 12 lymph nodes.
- Cancer was found in or near the margin (edge) of the removed tissue, meaning that some cancer may have been left behind.
- The cancer had blocked off (obstructed) the colon.
- The cancer caused a perforation (hole) in the wall of the colon.

Not all doctors agree on when chemo should be used for stage II colon cancers. It's important for you to discuss the pros and cons of chemo with your doctor, including how much it might reduce your risk of recurrence and what the likely side effects will be.

If chemo is used, the main options include 5-FU and leucovorin, oxaliplatin, or capecitabine, but other combinations may also be used.

## Treating stage III colon cancer

Stage III colon cancers have spread to nearby lymph nodes, but they have not yet spread to other parts of the body.

Surgery to remove the section of the colon with the cancer (partial colectomy) along with nearby lymph nodes, followed by adjuvant chemo is the standard treatment for this stage.

For chemo, either the **FOLFOX** (5-FU, leucovorin, and oxaliplatin) or **CapeOx** (capecitabine and oxaliplatin) regimens are used most often, but some patients may get 5-FU with leucovorin or capecitabine alone based on their age and health needs.

Radiation therapy and/or chemo may be options for people who aren't healthy enough for surgery.

## Treating stage IV colon cancer

Stage IV colon cancers have spread from the colon to distant organs and tissues. Colon cancer most often spreads to the liver, but it can also spread to other places like the lungs, brain, peritoneum (the lining of the abdominal cavity), or to distant lymph nodes.

In most cases surgery is unlikely to cure these cancers. But if there are only a few small areas of cancer spread (metastases) in the liver or lungs and they can be removed along with the colon cancer, surgery may help you live longer. This would mean having surgery to remove the section of the colon containing the cancer along with nearby lymph nodes, plus surgery to remove the areas of cancer spread. Chemo is typically given as well, before and/or after surgery. In some cases, [hepatic artery infusion](#) may be used if the cancer has spread to the liver.

If the metastases cannot be removed because they're too big or there are too many of them, chemo may be given before any surgery (neoadjuvant chemo). Then, if the tumors shrink, surgery to remove them may be tried. Chemo would then be given again after surgery. For tumors in the liver, another option may be to destroy them with [ablation or embolization](#).

If the cancer has spread too much to try to cure it with surgery, chemo is the main treatment. Surgery might still be needed if the cancer is blocking the colon or is likely to

do so. Sometimes, such surgery can be avoided by putting a [stent](#) (a hollow metal or plastic tube) into the colon during a colonoscopy to keep it open. Otherwise, operations such as a colectomy or [diverting colostomy](#) (cutting the colon above the level of the cancer and attaching the end to an opening in the skin on the belly to allow waste out) may be used.

If you have stage IV cancer and your doctor recommends surgery, it's very important to understand the goal of the surgery whether it's to try to cure the cancer or to prevent or relieve symptoms of the disease.

Most people with stage IV cancer will get chemo and/or [targeted therapies](#) to control the cancer. Some of the most commonly used regimens include:

- FOLFOX: leucovorin, 5-FU, and oxaliplatin (Eloxatin)
- FOLFIRI: leucovorin, 5-FU, and irinotecan (Camptosar)
- CAPEOX or CAPOX : capecitabine (Xeloda) and oxaliplatin
- FOLFOXIRI: leucovorin, 5-FU, oxaliplatin, and irinotecan
- One of the above combinations plus either a drug that targets VEGF, (bevacizumab [Avastin], ziv-aflibercept [Zaltrap], or ramucirumab [Cyramza]), or a drug that targets EGFR (cetuximab [Erbix) or panitumumab [Vectibix])
- 5-FU and leucovorin, with or without a targeted drug
- Capecitabine, with or without a targeted drug
- Irinotecan, with or without a targeted drug
- Cetuximab alone
- Panitumumab alone
- Regorafenib (Stivarga) alone
- Trifluridine and tipiracil (Lonsurf)

The choice of regimens depends on several factors, including any previous treatments you've had and your overall health.

If one of these regimens is no longer working, another may be tried. For people with certain gene changes in their cancer cells, another option after initial chemotherapy might be treatment with an [immunotherapy drug](#) such as pembrolizumab (Keytruda).

For advanced cancers, [radiation therapy](#) can also be used to help prevent or relieve symptoms such as pain. It may shrink tumors for a time, but it's not likely to cure the cancer. If your doctor recommends radiation therapy, it's important that you understand the goal of treatment.



## Treating recurrent colon cancer

Recurrent cancer means that the cancer has come back after treatment. The recurrence may be local (near the area of the initial tumor), or it may be in distant organs.

### Local recurrence

If the cancer comes back locally, surgery (often followed by chemo) can sometimes help you live longer and may even cure you. If the cancer can't be removed surgically, chemo might be tried first. If it shrinks the tumor enough, surgery might be an option. This would again be followed by more chemo.

### Distant recurrence

If the cancer comes back in a distant site, it's most likely to appear in the liver first. Surgery might be an option for some people. If not, chemo may be tried to shrink the tumor(s), which may then be followed by surgery to remove them. [Ablation or embolization](#) techniques might also be an option to treat some liver tumors.

If the cancer has spread too much to be treated with surgery, chemo and/or [targeted therapies](#) may be used. Possible regimens are the same as for stage IV disease.

For people whose cancers are found to have certain traits on lab tests, another option might be treatment with [immunotherapy](#).

Your options depend on which, if any, drugs you had before the cancer came back and how long ago you got them, as well as your overall health. You may still need surgery at some point to relieve or prevent blockage of the colon or other local problems. [Radiation therapy](#) may be an option to relieve symptoms as well.

Recurrent cancers can often be hard to treat, so you might also want to ask your doctor if [clinical trials](#)<sup>3</sup> of newer treatments are available.

For more on recurrence, see [Understanding Recurrence](#)<sup>4</sup>.

*The treatment information given here is not official policy of the American Cancer Society and is not intended as medical advice to replace the expertise and judgment of your cancer care team. It is intended to help you and your family make informed decisions, together with your doctor. Your doctor may have reasons for suggesting a treatment plan different from these general treatment options. Don't hesitate to ask him or her questions about your treatment options.*

## Hyperlinks

1. [www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/staged.html](http://www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/staged.html)
2. [www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/staged.html](http://www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/staged.html)
3. [www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html](http://www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html)
4. [www.cancer.org/treatment/survivorship-during-and-after-treatment/understanding-recurrence.html](http://www.cancer.org/treatment/survivorship-during-and-after-treatment/understanding-recurrence.html)

Last Medical Review: February 21, 2018 Last Revised: October 19, 2018

---

# Treatment of Rectal Cancer, by Stage

Treatment for rectal cancer is based largely on the [stage](#)<sup>1</sup> (extent) of the cancer, although other factors can also be important.

People with rectal cancers that have not spread to distant sites are usually treated with [surgery](#). Treatment with [radiation](#) and [chemotherapy](#) (chemo) may also be used before or after surgery.

## Treating stage 0 rectal cancer

Stage 0 rectal cancers have not grown beyond the inner lining of the rectum. Removing or destroying the cancer is typically all that's needed. You can usually be treated with surgery such as a polypectomy (removing the polyp), local excision, or transanal resection.

## Treating stage I rectal cancer

Stage I rectal cancers have grown into deeper layers of the rectal wall but have not spread outside the rectum itself.

This stage includes cancers that were part of a polyp. If the polyp is removed completely during colonoscopy, with no cancer in the edges, no other treatment may be needed. If the cancer in the polyp was high grade (see [Colorectal Cancer Stages](#)<sup>2</sup>), or if

there were cancer cells at the edges of the polyp, you might be advised to have more surgery. More surgery may also be advised if the polyp couldn't be removed completely or if it had to be removed in many pieces, making it hard to see if there were cancer cells at the edges (margins).

For other stage I cancers, surgery is usually the main treatment. Some small stage I cancers can be removed through the anus without cutting the abdomen (belly), using transanal resection or transanal endoscopic microsurgery (TEM). For other cancers, a low anterior resection (LAR), proctectomy with colo-anal anastomosis, or an abdominoperineal resection (APR) may be done, depending on exactly where the cancer is located within the rectum.

Additional treatment typically isn't needed after these operations, unless the surgeon finds the cancer is more advanced than was thought before surgery. If it is more advanced, a combination of chemo and radiation therapy is usually given. 5-FU and capecitabine are the chemo drugs most often used.

If you're too sick to have surgery, you may be treated with radiation therapy, although this hasn't been proven to work as well as surgery.

## Treating stage II rectal cancer

Many stage II rectal cancers have grown through the wall of the rectum and might extend into nearby tissues. They have not spread to the lymph nodes.

Most people with stage II rectal cancer will be treated with chemotherapy, radiation therapy, and surgery, although the order of these treatments might be different for some people. For example, here's a common approach to treating these cancers:

- Many people get both chemo and radiation therapy (called *chemoradiation*) as their first treatment. The chemo given with radiation is usually either 5-FU or capecitabine (Xeloda).
- This is usually followed by surgery, such as a low anterior resection (LAR), proctectomy with colo-anal anastomosis, or abdominoperineal resection (APR), depending on where the cancer is in the rectum. If the chemo and radiation therapy shrink the tumor enough, sometimes a transanal resection can be done instead of a more invasive LAR or APR. This might help you avoid having a colostomy. But not all doctors agree with this method, because it doesn't let the surgeon check the nearby lymph nodes for cancer.
- Additional chemo is then given after surgery, usually for a total of about 6 months.

The chemo may be the FOLFOX regimen (oxaliplatin, 5-FU, and leucovorin), 5-FU and leucovorin, CAPEOx (capecitabine plus oxaliplatin) or capecitabine alone, based on what's best suited to your health needs.

Another option might be to get chemotherapy alone first, followed by chemo plus radiation therapy, then followed by surgery.

For people who can't have chemo plus radiation for some reason, surgery (such as an LAR, proctectomy with colo-anal anastomosis, or APR) might be done first. This might be followed by chemo, and sometimes radiation therapy.

## Treating stage III rectal cancer

Stage III rectal cancers have spread to nearby lymph nodes but not to other parts of the body.

Most people with stage III rectal cancer will be treated with chemotherapy, radiation therapy, and surgery, although the order of these treatments might differ.

Most often, chemo is given along with radiation therapy (called *chemoradiation*) first. This may shrink the cancer, often making it easier to take out larger tumors. It also lowers the chance that the cancer will come back in the pelvis. Giving radiation before surgery also tends to lead to fewer problems than giving it after surgery.

Chemoradiation is followed by surgery to remove the rectal tumor and nearby lymph nodes, usually by low anterior resection (LAR), proctectomy with colo-anal anastomosis, or abdominoperineal resection (APR), depending on where the cancer is in the rectum. If the cancer has reached nearby organs, a more extensive operation known as pelvic exenteration may be needed.

After surgery, chemo is given, usually for about 6 months. The most common regimens include FOLFOX (oxaliplatin, 5-FU, and leucovorin), 5-FU and leucovorin, CAPEOX (capecitabine plus oxaliplatin), or capecitabine alone. Your doctor will recommend the one best suited to your health needs.

Another option might be to get chemotherapy alone first, followed by chemo plus radiation therapy, then followed by surgery.

For people who can't have chemo plus radiation for some reason, surgery (such as an LAR, proctectomy with colo-anal anastomosis, or APR) might be the first treatment. This

might be followed by chemotherapy, sometimes along with radiation therapy.

## Treating stage IV rectal cancer

Stage IV rectal cancers have spread to distant organs and tissues such as the liver or lungs. Treatment options for stage IV disease depend to some extent on how widespread the cancer is.

If there's a chance that all of the cancer can be removed (for example, there are only a few tumors in the liver or lungs), the most common treatment options include:

- Surgery to remove the rectal tumor and distant tumors, followed by chemo (and/or radiation therapy in some cases)
- Chemo, followed by surgery to remove the rectal tumor and distant tumors, usually followed by chemo and radiation therapy (chemoradiation)
- Chemo, followed by chemoradiation, followed by surgery to remove the rectal tumor and distant tumors. This might be followed by more chemotherapy.
- Chemoradiation, followed by surgery to remove the rectal tumor and distant tumors. This might be followed by chemotherapy.

These approaches may help you live longer. Surgery to remove the rectal tumor would usually be a low anterior resection (LAR), proctectomy with colo-anal anastomosis, or abdominoperineal resection (APR), depending on where it's located.

If the only site of cancer spread is the liver, you might be treated with chemo that's put right into the artery leading to the liver ([hepatic artery infusion](#)). This may shrink the cancers in the liver better than if the chemo is given into a vein (IV) or by mouth.

If the cancer is more widespread and can't be removed completely by surgery, treatment options depend on whether the cancer is causing a blockage of the intestine. If it is, surgery might be needed right away. If not, the cancer will likely be treated with chemo and/or [targeted therapy](#) drugs (without surgery). Some of the options include:

- FOLFOX: leucovorin, 5-FU, and oxaliplatin (Eloxatin)
- FOLFIRI: leucovorin, 5-FU, and irinotecan (Camptosar)
- CAPEOX or CAPOX: capecitabine (Xeloda) and oxaliplatin
- FOLFOXIRI: leucovorin, 5-FU, oxaliplatin, and irinotecan
- One of the above combinations, plus either a drug that targets VEGF (bevacizumab [Avastin], ziv-aflibercept [Zaltrap], or ramucirumab [Cyramza]), or a drug that

- targets EGFR (cetuximab [Erbix] or panitumumab [Vectibix])
- 5-FU and leucovorin, with or without a targeted drug
- Capecitabine, with or without a targeted drug
- Irinotecan, with or without a targeted drug
- Cetuximab alone
- Panitumumab alone
- Regorafenib (Stivarga) alone
- Trifluridine and tipiracil (Lonsurf)

The choice of regimens depends on several factors, including any previous treatments, your overall health, and how well you can tolerate treatment.

If chemo shrinks the tumors, in some cases it may be possible to consider surgery to try to remove all of the cancer at this point. Chemo may then be given again after surgery.

If the tumor doesn't shrink, a different drug combination may be tried. For people with certain gene changes in their cancer cells, another option after initial chemotherapy might be treatment with an [immunotherapy drug](#) such as pembrolizumab (Keytruda).

For cancers that don't shrink with chemo and widespread cancers that are causing symptoms, treatment is done to relieve symptoms and avoid long-term problems such as bleeding or blockage of the intestines. Treatments may include one or more of these:

- Removing the rectal tumor with surgery
- Surgery to create a colostomy and bypass the rectal tumor (a [diverting colostomy](#))
- Using a special laser to destroy the tumor within the rectum
- Placing a [stent](#) (hollow plastic or metal tube) within the rectum to keep it open; this does not require surgery
- Chemoradiation therapy
- Chemo alone

If tumors in the liver can't be removed by surgery because they are too big or there are too many of them, it may be possible to destroy them (partially or completely) with [ablation or embolization](#).

## Treating recurrent rectal cancer

Recurrent cancer means that the cancer has come back after treatment. It may come back near the area of the initial rectal tumor (locally) or in distant organs, like the lungs

or liver. If the cancer does recur, it's usually in the first 2 to 3 years after surgery, but it can also recur much later.

### Local recurrence

If the cancer comes back in the pelvis (locally), it's treated with surgery to remove the cancer, if possible. This surgery is often more extensive than the initial surgery. In some cases radiation therapy may be given during the surgery (this is called intraoperative radiotherapy) or afterward. Chemo may also be given after surgery. Radiation therapy might be used as well, if it was not used before.

### Distant recurrence

If the cancer comes back in a distant part of the body, the treatment will depend on whether it can be removed by surgery.

If the cancer can be removed, surgery is done. Chemo may be given **before** surgery (see Treating stage IV rectal cancer above for a list of possible drug regimens). Chemo is given **after** surgery, too. When the cancer has spread to the liver, chemo may be given through the hepatic artery leading to the liver.

If the cancer can't be removed by surgery, chemo and/or [targeted therapy drugs](#) may be used. For people with certain gene changes in their cancer cells, another option might be treatment with [immunotherapy](#). The regimen used will depend on what a person has received previously and on their overall health. If the cancer doesn't shrink, a different drug combination may be tried.

As with stage IV rectal cancer, surgery, radiation therapy, or other approaches may be used at some point to relieve symptoms and avoid long-term problems such as bleeding or blockage of the intestines.

These cancers can often be hard to treat, so you might also want to ask your doctor if there are any [clinical trials](#)<sup>3</sup> of newer treatments that might be right for you.

For more on recurrence, see [Understanding Recurrence](#)<sup>4</sup>.

*The treatment information given here is not official policy of the American Cancer Society and is not intended as medical advice to replace the expertise and judgment of your cancer care team. It is intended to help you and your family make informed decisions, together with your doctor. Your doctor may have reasons for suggesting a treatment plan different from these general treatment options. Don't hesitate to ask him*



or her questions about your treatment options.

## Hyperlinks

1. [www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/staged.html](http://www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/staged.html)
2. [www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/staged.html](http://www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/staged.html)
3. [www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html](http://www.cancer.org/treatment/treatments-and-side-effects/clinical-trials.html)
4. [www.cancer.org/treatment/survivorship-during-and-after-treatment/understanding-recurrence/coping-with-cancer-recurrence.html](http://www.cancer.org/treatment/survivorship-during-and-after-treatment/understanding-recurrence/coping-with-cancer-recurrence.html)

## References

Libutti SK, Willett CG, Salz LB, Levine RA. Chapter 60: Cancer of the rectum. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

National Cancer Institute. Rectal Cancer Treatment (PDQ®)—Patient Version. May 19, 2017. Accessed at [www.cancer.gov/types/colorectal/patient/rectal-treatment-pdq](http://www.cancer.gov/types/colorectal/patient/rectal-treatment-pdq) on February , 14 2018.

National Comprehensive Cancer Network, Clinical Practice Guidelines in Oncology (NCCN Guidelines®), Rectal Cancer, Version 4.2017 -- January 18, 2018. Accessed at [www.nccn.org/professionals/physician\\_gls/pdf/rectal.pdf](http://www.nccn.org/professionals/physician_gls/pdf/rectal.pdf) on February 14, 2018.

Sigurdson ER, Benson AB, Minsky B. Cancer of the rectum. In: Niederhuber JE, Armitage JO, Dorshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5th ed. Philadelphia, Pa. Elsevier: 2014: 1336-1359.

Last Medical Review: February 21, 2018 Last Revised: October 19, 2018

## Written by

The American Cancer Society medical and editorial content team  
([www.cancer.org/cancer/acs-medical-content-and-news-staff.html](http://www.cancer.org/cancer/acs-medical-content-and-news-staff.html))



Our team is made up of doctors and oncology certified nurses with deep knowledge of cancer care as well as journalists, editors, and translators with extensive experience in medical writing.

American Cancer Society medical information is copyrighted material. For reprint requests, please see our Content Usage Policy ([www.cancer.org/about-us/policies/content-usage.html](http://www.cancer.org/about-us/policies/content-usage.html)).

**cancer.org | 1.800.227.2345**



[cancer.org](https://www.cancer.org) | 1.800.227.2345

---

## After Colorectal Cancer Treatment

### Living as a Cancer Survivor

For many people, cancer treatment often leads to questions about the next steps as a survivor or about the chances of the cancer coming back.

- [Living as a Colorectal Cancer Survivor](#)

### Cancer Concerns After Treatment

Treatment may remove or destroy the cancer, but it's very common to worry about the risk of developing another cancer.

- [Second Cancers After Colorectal Cancer](#)

---

## Living as a Colorectal Cancer Survivor

For many people with [colorectal cancer](#)<sup>1</sup>, treatment can remove or destroy the cancer. The end of treatment can be both stressful and exciting. You'll be relieved to finish treatment, yet it's hard not to worry about [cancer coming back](#)<sup>2</sup>. This is very common if you've had cancer.

For other people, colorectal [cancer may never go away](#)<sup>3</sup> completely. Some people may get regular treatment with [chemotherapy](#)<sup>4</sup>, [radiation therapy](#)<sup>5</sup>, or other treatments to try to help keep the cancer in check. Learning to live with cancer that does not go away can

be difficult and very stressful.

Life after colorectal cancer means returning to some familiar things and also making some new choices.

## Ask your doctor for a survivorship care plan

Talk with your doctor about developing a [survivorship care](#)<sup>6</sup> plan for you. This plan might include:

- A suggested schedule for follow-up exams and tests
- A schedule for other tests you might need in the future, such as [early detection \(screening\) tests](#)<sup>7</sup> for other types of cancer, or tests to look for long-term health effects from your cancer or its treatment
- A list of possible late- or long-term side effects from your treatment, including what to watch for and when you should contact your doctor
- Diet and physical activity suggestions
- Reminders to keep your appointments with your primary care provider (PCP) who will monitor your general health care, including your cancer screening tests.

## Typical follow-up schedules after colorectal cancer

Even if you have completed treatment, you will likely have follow-up visits with your doctor for many years. It's very important to go to all of your follow-up appointments. During these visits, your doctors will ask if you are having any problems and may do exams and lab tests or imaging tests to look for signs of cancer or treatment [side effects](#)<sup>8</sup>.

Some treatment side effects might last a long time or might not even show up until years after you have finished treatment. Your doctor visits are a good time to ask questions and talk about any changes or problems you notice or concerns you have.

To some extent, the frequency of follow up visits and tests will depend on the [stage](#)<sup>9</sup> of your cancer and the chance of it [coming back](#)<sup>10</sup>.

### Doctor visits

Your doctor will probably recommend you have a physical exam and some some of the

tests listed below every 3 to 6 months for the first couple of years after treatment, then every 6 months or so for the next few years. People who were treated for early-stage cancers may do this less often.

## **Follow-up tests**

### ***Colonoscopy***

In most cases, your doctor will recommend you have a [colonoscopy](#)<sup>11</sup> within a year after surgery. If the results are normal, most people won't need another one for 3 years. If the results of that exam are normal, then future exams often can be about every 5 years. If the colonoscopy shows abnormal areas or polyps, the test may be needed more often.

### ***Proctoscopy***

If you had rectal cancer that was removed with a [transanal excision](#)<sup>12</sup> (the surgery was done through your anus), your doctor will likely recommend you have a [proctoscopy](#)<sup>13</sup> every 3 to 6 months for the first couple of years after treatment, then every 6 months or so for the next few years. This allows the doctor to get a close look at the area where the tumor was to see if the cancer might be coming back.

### ***Imaging tests***

Whether or not your doctor recommends imaging tests will depend on the stage of your cancer and other factors. [CT scans](#)<sup>14</sup> may be done regularly, such as once every 6 months to a year, for those at higher risk of recurrence, especially in the first few years after treatment. People who had tumors in the liver or lungs removed might be scanned even more often, maybe every 3 to 6 months for the first few years.

### ***Blood tests for tumor markers***

[Carcinoembryonic antigen \(CEA\)](#)<sup>15</sup> is a substance called a tumor marker that can be found in the blood of some people with colorectal cancer. Doctors often check levels of this marker with a blood test before treatment begins.

If it's high at first and then goes down to normal after surgery, it can be checked again when you come in for follow-up (typically every 3 to 6 months for the first couple of years after treatment, then every 6 months or so for the next few years). If the CEA level goes up again, it might be a sign that the cancer has come back, and colonoscopy or imaging tests might be done to try to locate the site of recurrence.

If tumor marker levels weren't elevated when the cancer was first found, they aren't likely to be helpful as a sign of the cancer coming back.

## Keeping health insurance and copies of your medical records

Even after treatment, it's very important to keep [health insurance](#)<sup>16</sup>. Tests and doctor visits cost a lot, and even though no one wants to think of their cancer coming back, this could happen.

At some point after your cancer treatment, you might find yourself seeing a new doctor who doesn't know about your medical history. It's important to keep copies of your medical records to give your new doctor the details of your diagnosis and treatment. Learn more in [Keeping Copies of Important Medical Records](#)<sup>17</sup>.

## Managing long-term side effects

Most [side effects](#)<sup>18</sup> go away after treatment ends, but some may continue and need special care to manage. For example, if you have a colostomy or ileostomy, you may worry about doing even everyday activities. Whether your ostomy is temporary or permanent, a health care professional trained to help people with colostomies and ileostomies (called an enterostomal therapist) can teach you how to care for it. You can ask the American Cancer Society about programs offering information and support in your area. Learn more about managing and caring for an ostomy in [Colostomy Guide](#)<sup>19</sup> and [Ileostomy Guide](#)<sup>20</sup>.

## Can I lower my risk of colorectal cancer progressing or coming back?

If you have (or have had) colorectal cancer, you probably want to know if there are things you can do to help lower your risk of the cancer growing or coming back, such as exercising, eating a certain type of diet, or taking nutritional supplements. Fortunately, research has shown there are some things you can do that might be helpful.

### Getting to and staying at a healthy weight

A lot of research suggests that being overweight or obese (very overweight) raises your risk of colorectal cancer coming back, as well as the risk of dying from colorectal cancer. But there's less research to show whether losing weight during or after treatment can actually lower the risk of colorectal cancer recurrence.

Of course, getting to a healthy weight has other health benefits. But if you're thinking

about losing weight, it's important to discuss this with your doctor, especially if you're still getting treatment or have just finished it.

## Being active

A good deal of research suggests that people who get regular physical activity after treatment have a lower risk of colorectal cancer recurrence and a lower risk of dying from colorectal cancer. Physical activity has also been linked to improvements in quality of life, physical functioning, and fewer [fatigue](#)<sup>21</sup> symptoms. It's not clear exactly how much activity might be needed, but more seems to be better.

It's important to talk with your treatment team before starting a new physical activity program. This might include meeting with a physical therapist, too. Your team can help you plan a program that can be both safe and effective for you.

## Eating a healthy diet

In general, it's not clear that eating any specific type of diet can help lower your risk of colorectal cancer coming back. Some studies have suggested that colorectal cancer survivors who eat diets high in vegetables, fruits, whole grains, chicken, and fish might live longer than those who eat diets with more refined sugars, fats, and red or processed meats. But it's not clear if this is due to effects on colorectal cancer or possibly to other health benefits of eating a healthy diet.

Still, there are clearly health benefits to eating well. For example, diets that are rich in plant sources are often an important part of getting to and staying at a healthy weight. Eating a healthy diet can also help lower your risk for some other health problems, such as heart disease and diabetes.

## Dietary supplements

So far, no dietary supplements have been shown to clearly help lower the risk of colorectal cancer progressing or coming back. This doesn't mean that none will help, but it's important to know that none have been proven to do so.

**Vitamin D:** Some research has suggested that colorectal cancer survivors with higher levels of vitamin D in their blood might have better outcomes than those with lower levels. But it's not yet clear if taking vitamin D supplements can affect outcomes.

**Calcium:** Some research has suggested that calcium supplements can lower the risk of colorectal polyps in people who have previously had polyps. But it's not clear if calcium

supplements can lower the risk of colorectal cancer coming back.

Dietary supplements are not regulated like medicines in the United States – they do not have to be proven to work (or even be safe) before being sold, although there are limits on what they're allowed to claim they can do. If you're thinking about taking any type of nutritional supplement, talk to your health care team first. They can help you decide which ones you can use safely while avoiding those that could be harmful.

## **Alcohol**

Drinking alcohol has been linked with an increased risk of getting colorectal cancer, especially in men. But whether alcohol affects the risk of colorectal cancer recurrence is not as clear.

The American Cancer Society recommends that people who drink alcohol limit their intake to no more than 1 drink a day for women and no more than 2 drinks a day for men. This can help lower their risk of *getting* certain types of cancer (including colorectal cancer). But for people who have finished cancer treatment, the effects of alcohol on recurrence risk are largely unknown.

This issue is complicated by the fact that low to moderate alcohol use has been linked with a lower risk of heart disease.

Because this issue is complex, it's important to discuss it with your health care team, taking into account your risk of colorectal cancer recurrence (or getting a new colorectal cancer), your risk of heart disease, and your risk of other health issues linked to alcohol use.

## **Quitting smoking**

Research has shown that colorectal cancer survivors who smoke are more likely to die from their cancer (as well as from other causes). Aside from any effects on colorectal cancer risk, [quitting smoking can clearly have many other health benefits](#)<sup>22</sup>.

If you're thinking about [quitting smoking](#)<sup>23</sup> and need help, talk to your doctor, or call the American Cancer Society at 1-800-227-2345 for information and support.

## **If the cancer comes back**

If the cancer does recur at some point, your treatment options will depend on where the cancer is, what treatments you've had before, and your overall health. For more

information on how recurrent cancer is treated, see [Treatment of Colon Cancer, by Stage](#)<sup>24</sup> or [Treatment of Rectal Cancer, by Stage](#)<sup>25</sup>.

For more general information on recurrence, see [Understanding Recurrence](#)<sup>26</sup>.

## Could I get a second cancer after colorectal cancer treatment?

People who've had colorectal cancer can still get other cancers. In fact, colorectal cancer survivors are at higher risk for getting another colorectal cancer, as well as some other types of cancer. Learn more in [Second Cancers After Colorectal Cancer](#).

## Moving on after colorectal cancer

### Emotional support

Some amount of feeling [depressed, anxious, or worried](#)<sup>27</sup> is normal when colorectal cancer is a part of your life. Some people are affected more than others. But everyone can benefit from help and support from other people, whether friends and family, religious groups, support groups, professional counselors, or others.

### Sexuality and feeling good about your body

Learning to be comfortable with your body during and after colorectal cancer treatment is a personal journey, one that is different for everyone. Information and support can help you cope with these changes over time. Learn more in [Sexuality for the Man With Cancer](#)<sup>28</sup> or [Sexuality for the Woman With Cancer](#)<sup>29</sup>.

## Hyperlinks

1. [www.cancer.org/cancer/colon-rectal-cancer/about/what-is-colorectal-cancer.html](http://www.cancer.org/cancer/colon-rectal-cancer/about/what-is-colorectal-cancer.html)
2. [www.cancer.org/treatment/survivorship-during-and-after-treatment/understanding-recurrence.html](http://www.cancer.org/treatment/survivorship-during-and-after-treatment/understanding-recurrence.html)
3. [www.cancer.org/treatment/survivorship-during-and-after-treatment/when-cancer-doesnt-go-away.html](http://www.cancer.org/treatment/survivorship-during-and-after-treatment/when-cancer-doesnt-go-away.html)
4. [www.cancer.org/cancer/colon-rectal-cancer/treating/chemotherapy.html](http://www.cancer.org/cancer/colon-rectal-cancer/treating/chemotherapy.html)
5. [www.cancer.org/cancer/colon-rectal-cancer/treating/radiation-therapy.html](http://www.cancer.org/cancer/colon-rectal-cancer/treating/radiation-therapy.html)
6. [www.cancer.org/treatment/survivorship-during-and-after-treatment/survivorship-care-plans.html](http://www.cancer.org/treatment/survivorship-during-and-after-treatment/survivorship-care-plans.html)
7. [www.cancer.org/healthy/find-cancer-early.html](http://www.cancer.org/healthy/find-cancer-early.html)



8. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html)
9. [www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/staged.html](http://www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/staged.html)
10. [www.cancer.org/treatment/survivorship-during-and-after-treatment/understanding-recurrence.html](http://www.cancer.org/treatment/survivorship-during-and-after-treatment/understanding-recurrence.html)
11. [www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/how-diagnosed.html](http://www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/how-diagnosed.html)
12. [www.cancer.org/cancer/colon-rectal-cancer/treating/rectal-surgery.html](http://www.cancer.org/cancer/colon-rectal-cancer/treating/rectal-surgery.html)
13. [www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/how-diagnosed.html](http://www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/how-diagnosed.html)
14. [www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/how-diagnosed.html](http://www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/how-diagnosed.html)
15. [www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/how-diagnosed.html](http://www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/how-diagnosed.html)
16. [www.cancer.org/treatment/finding-and-paying-for-treatment/understanding-health-insurance/managing-your-health-insurance.html](http://www.cancer.org/treatment/finding-and-paying-for-treatment/understanding-health-insurance/managing-your-health-insurance.html)
17. [www.cancer.org/treatment/survivorship-during-and-after-treatment/be-healthy-after-treatment/keeping-copies-of-important-medical-records.html](http://www.cancer.org/treatment/survivorship-during-and-after-treatment/be-healthy-after-treatment/keeping-copies-of-important-medical-records.html)
18. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects.html)
19. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/ostomies/colostomy.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/ostomies/colostomy.html)
20. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/ostomies/ileostomy.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/ostomies/ileostomy.html)
21. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/fatigue.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/fatigue.html)
22. [www.cancer.org/healthy/stay-away-from-tobacco/benefits-of-quitting-smoking-over-time.html](http://www.cancer.org/healthy/stay-away-from-tobacco/benefits-of-quitting-smoking-over-time.html)
23. [www.cancer.org/healthy/stay-away-from-tobacco/guide-quitting-smoking.html](http://www.cancer.org/healthy/stay-away-from-tobacco/guide-quitting-smoking.html)
24. [www.cancer.org/cancer/colon-rectal-cancer/treating/by-stage-colon.html](http://www.cancer.org/cancer/colon-rectal-cancer/treating/by-stage-colon.html)
25. [www.cancer.org/cancer/colon-rectal-cancer/treating/by-stage-rectum.html](http://www.cancer.org/cancer/colon-rectal-cancer/treating/by-stage-rectum.html)
26. [www.cancer.org/treatment/survivorship-during-and-after-treatment/understanding-recurrence/coping-with-cancer-recurrence.html](http://www.cancer.org/treatment/survivorship-during-and-after-treatment/understanding-recurrence/coping-with-cancer-recurrence.html)
27. [www.cancer.org/treatment/treatments-and-side-effects/emotional-side-effects.html](http://www.cancer.org/treatment/treatments-and-side-effects/emotional-side-effects.html)
28. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/fertility-and-sexual-side-effects/sexuality-for-men-with-cancer.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/fertility-and-sexual-side-effects/sexuality-for-men-with-cancer.html)
29. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/fertility-and-sexual-side-effects/sexuality-for-women-with-cancer.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/fertility-and-sexual-side-effects/sexuality-for-women-with-cancer.html)

## References

Libutti SK, Salz LB, Willett CG, Levine RA. Chapter 57: Cancer of the colon. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

Libutti SK, Willett CG, Salz LB, Levine RA. Chapter 60: Cancer of the rectum. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

National Comprehensive Cancer Network, Clinical Practice Guidelines in Oncology (NCCN Guidelines®), Colon Cancer, Version 1.2018 -- January 18, 2018. Accessed at [www.nccn.org/professionals/physician\\_gls/pdf/colon.pdf](http://www.nccn.org/professionals/physician_gls/pdf/colon.pdf) on February 15, 2018.

National Comprehensive Cancer Network, Clinical Practice Guidelines in Oncology (NCCN Guidelines®), Rectal Cancer, Version 4.2017 -- January 18, 2018. Accessed at [www.nccn.org/professionals/physician\\_gls/pdf/rectal.pdf](http://www.nccn.org/professionals/physician_gls/pdf/rectal.pdf) on February 15, 2018.

Sigurdson ER, Benson AB, Minsky B. Cancer of the rectum. In: Niederhuber JE, Armitage JO, Dorshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5th ed. Philadelphia, Pa. Elsevier: 2014: 1336-1359.

Van Schaeybroeck S, Lawler M, Johnston B, et al. Colorectal cancer. In: Neiderhuber JE, Armitage JO, Dorshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5th ed. Philadelphia, Pa: Elsevier; 2014: 1278-1335.

Last Medical Review: February 21, 2018 Last Revised: February 21, 2018

---

## Second Cancers After Colorectal Cancer

Colorectal cancer survivors can be affected by a number of health problems, but often a major concern is facing cancer again. Cancer that comes back after treatment is called a *recurrence*. But some cancer survivors develop a new, unrelated cancer later. This is

called a *second cancer*.

Unfortunately, being treated for colorectal cancer doesn't mean you can't get another cancer. People who have had colorectal cancer can still get the same types of cancers that other people get. In fact, they might be at higher risk for certain types of cancer.

People who have had **colon cancer** can get any type of second cancer, but they have an increased risk of certain cancers, including:

- A second colon cancer (This is different from the first cancer coming back.)
- Rectal cancer
- [Stomach cancer](#)<sup>1</sup>
- [Small intestine cancer](#)<sup>2</sup>
- [Anal cancer](#)<sup>3</sup>
- [Bile duct cancer](#)<sup>4</sup>
- [Uterine cancer](#)<sup>5</sup>
- [Kidney cancer](#)<sup>6</sup>
- Cancer of the ureter (the tube that connects the kidney to the bladder)

People who have had **rectal cancer** can get any type of second cancer, but they are at increased risk of certain cancers, including:

- Colon cancer
- Small intestine cancer
- Anal cancer
- [Lung cancer](#)<sup>7</sup>
- [Vaginal cancer](#)<sup>8</sup>
- Kidney cancer

The increased risk with some of these cancers may be due to shared risk factors, such as diet, obesity, and physical activity. Genetics may also be a factor. For example, people with Lynch syndrome (hereditary non-polyposis colorectal cancer) have an increased risk of many of these cancers.

## Follow-up after colorectal cancer treatment

After completing treatment for colorectal cancer, you should still see your doctor regularly to look for signs the cancer has come back or spread. See [Living As a Colorectal Cancer Survivor](#) for information on the types of tests you might need after

treatment.

Survivors of colorectal cancer should also follow the [American Cancer Society Guidelines for the Early Detection of Cancer](#)<sup>9</sup>, such as those for breast, cervical, lung, and prostate cancer.

For people who have had colorectal cancer, most experts don't recommend any additional testing to look for second cancers unless you have symptoms. One possible exception is in women who had colorectal cancer as a result of having Lynch syndrome, as these women are also at increased risk for [endometrial](#)<sup>10</sup> and some other cancers. If you have Lynch syndrome, it's important to talk to your doctor about your risks.

## Can I lower my risk of getting a second cancer?

There are steps you can take to lower your risk and stay as healthy as possible. For example, people who have had colorectal cancer should do their best to [stay away from tobacco products](#)<sup>11</sup>. Smoking might further increase the risk of some of the second cancers that are more common after colorectal cancer.

To help maintain good health, colorectal cancer survivors should also:

- [Get to and stay at a healthy weight](#)<sup>12</sup>
- [Keep physically active](#)<sup>13</sup>
- [Eat a healthy diet](#)<sup>14</sup>, with an emphasis on plant foods
- [Limit alcohol](#)<sup>15</sup> to no more than 1 drink per day for women or 2 per day for men

These steps may also lower the risk of some other health problems.

See [Second Cancers in Adults](#)<sup>16</sup> for more information about causes of second cancers.

## Hyperlinks

1. [www.cancer.org/cancer/stomach-cancer.html](http://www.cancer.org/cancer/stomach-cancer.html)
2. [www.cancer.org/cancer/small-intestine-cancer.html](http://www.cancer.org/cancer/small-intestine-cancer.html)
3. [www.cancer.org/cancer/anal-cancer.html](http://www.cancer.org/cancer/anal-cancer.html)
4. [www.cancer.org/cancer/bile-duct-cancer.html](http://www.cancer.org/cancer/bile-duct-cancer.html)
5. [www.cancer.org/cancer/uterine-sarcoma.html](http://www.cancer.org/cancer/uterine-sarcoma.html)
6. [www.cancer.org/cancer/kidney-cancer.html](http://www.cancer.org/cancer/kidney-cancer.html)
7. [www.cancer.org/cancer/lung-cancer.html](http://www.cancer.org/cancer/lung-cancer.html)

8. [www.cancer.org/cancer/vaginal-cancer.html](http://www.cancer.org/cancer/vaginal-cancer.html)
9. [www.cancer.org/healthy/find-cancer-early/cancer-screening-guidelines/american-cancer-society-guidelines-for-the-early-detection-of-cancer.html](http://www.cancer.org/healthy/find-cancer-early/cancer-screening-guidelines/american-cancer-society-guidelines-for-the-early-detection-of-cancer.html)
10. [www.cancer.org/cancer/endometrial-cancer.html](http://www.cancer.org/cancer/endometrial-cancer.html)
11. [www.cancer.org/healthy/stay-away-from-tobacco.html](http://www.cancer.org/healthy/stay-away-from-tobacco.html)
12. [www.cancer.org/healthy/eat-healthy-get-active/take-control-your-weight.html](http://www.cancer.org/healthy/eat-healthy-get-active/take-control-your-weight.html)
13. [www.cancer.org/healthy/eat-healthy-get-active/get-active.html](http://www.cancer.org/healthy/eat-healthy-get-active/get-active.html)
14. [www.cancer.org/healthy/eat-healthy-get-active/eat-healthy.html](http://www.cancer.org/healthy/eat-healthy-get-active/eat-healthy.html)
15. [www.cancer.org/cancer/cancer-causes/diet-physical-activity/alcohol-use-and-cancer.html](http://www.cancer.org/cancer/cancer-causes/diet-physical-activity/alcohol-use-and-cancer.html)
16. [www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/second-cancers-in-adults.html](http://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/second-cancers-in-adults.html)

## References

American Cancer Society. *Colorectal Cancer Facts & Figures 2017-2019*. Atlanta, Ga: American Cancer Society; 2017.

Libutti SK, Salz LB, Willett CG, Levine RA. Chapter 57: Cancer of the colon. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

Libutti SK, Willett CG, Salz LB, Levine RA. Chapter 60: Cancer of the rectum. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

Sigurdson ER, Benson AB, Minsky B. Cancer of the rectum. In: Niederhuber JE, Armitage JO, Dorshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5th ed. Philadelphia, Pa: Elsevier; 2014: 1336-1359.

Steele SR, Johnson EK, Champagne B et al. Endoscopy and polyps-diagnostic and therapeutic advances in management. *World J Gastroenterol* 2013; 19(27): 4277-4288.

Van Schaeybroeck S, Lawler M, Johnston B, et al. Colorectal cancer. In: Neiderhuber JE, Armitage JO, Dorshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5<sup>th</sup> ed. Philadelphia, Pa: Elsevier; 2014: 1278-1335.

Last Medical Review: February 21, 2018 Last Revised: February 21, 2018

**Written by**

The American Cancer Society medical and editorial content team  
([www.cancer.org/cancer/acs-medical-content-and-news-staff.html](http://www.cancer.org/cancer/acs-medical-content-and-news-staff.html))

Our team is made up of doctors and oncology certified nurses with deep knowledge of cancer care as well as journalists, editors, and translators with extensive experience in medical writing.

American Cancer Society medical information is copyrighted material. For reprint requests, please see our Content Usage Policy ([www.cancer.org/about-us/policies/content-usage.html](http://www.cancer.org/about-us/policies/content-usage.html)).

**cancer.org | 1.800.227.2345**